



With the support of the SPF Economie



## Identification of Key Topics of Interest

Chemical & Life Sciences Industry

### ABSTRACT

This report presents the results of a context-mining analysis conducted for essenscia, the Belgian federation for the chemistry and life sciences industries. It uses **Mynd-ware's** AI-enabled platform to map the technology landscape, highlight key topics of interest, and surface emerging trends and weak signals, with support from essenscia's Patent Cell (Cellule Brevets).

February 2026

Mynd-Ware & essenscia



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# Introduction

The chemical and life sciences industry stands at the intersection of rapid scientific advancement and pressing societal and geopolitical challenges, from climate change mitigation to personalized medicine. To navigate this complex landscape, data-driven identification and quantification of high-level trends is essential for strategic decision-making.

This report presents the outcomes of a comprehensive context-mining study commissioned by essenscia (the Belgian federation for the chemical and life sciences industries - <https://www.essenscia.be/fr/> ) and delivered by Mynd-ware (The AI-driven context-mining and technology discovery platform - <https://www.mynd-ware.com/> ) , in collaboration with essenscia's Patent Cell (Cellule Brevets).

The project was conducted in 2025, and the goals of this project were twofold:

- Data-driven identification and quantification of high-level trends within the Chemical and Life Sciences Industry.
- Determination of several topics for deep-dive analysis for actors in the chemical industry and life sciences.

The report is organised into four sections: (1) the approach, (2) an overarching trend analysis of EU-funded projects using CORDIS data, (3) a dedicated trend analysis for Chemistry, and (4) a dedicated trend analysis for Life Sciences.

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*We remain open to making corrections or adjustments to this report upon simple request.*

# Approach

## a) Process Flow

The report creation followed a structured, multi-source workflow that combines data extraction, unsupervised topic modelling, and expert interpretation to produce quantified trend insights. Calls for participation to the project have been widely spread.



## b) Knowledge Databases

Three complementary data sources were used to ensure comprehensive coverage across public research funding, scientific literature, and industrial innovation.



Government



Academia



Industry



**Government (CORDIS):** All project data was extracted from the public CORDIS Datalab Data Extraction Tool. Relevant projects were queried by selecting the relevant Fields of Science labelled on all projects within the Horizon Europe programme.

**Academia (Web of Science):** Review papers were sourced from Web of Science. Relevant papers were queried by selecting the relevant Web of Science Categories. The dataset was filtered to include only papers with at least one European affiliation, published from 2020 onward.

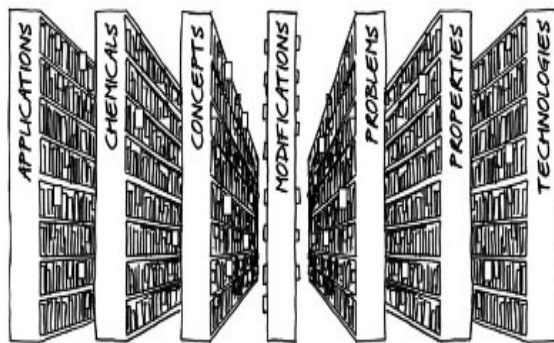
**Industry (Derwent Innovation):** Key patents were sourced from the Derwent Innovation database. Relevant patents were queried based on relevant CPC and IPC codes. The dataset was filtered to include only key patents (at least 5 family members), with at least one patent member filed in Europe, from 2020 onward

## c) About the Analysis

The analysis was conducted using the Mynd platform powered by an AI-driven, unsupervised topic-modelling engine. Mynd (<https://www.mynd-ware.com/>) is designed to automatically generate a hierarchical classification of topics discussed in extensive textual datasets, such as patents, academic papers, or research project descriptions.



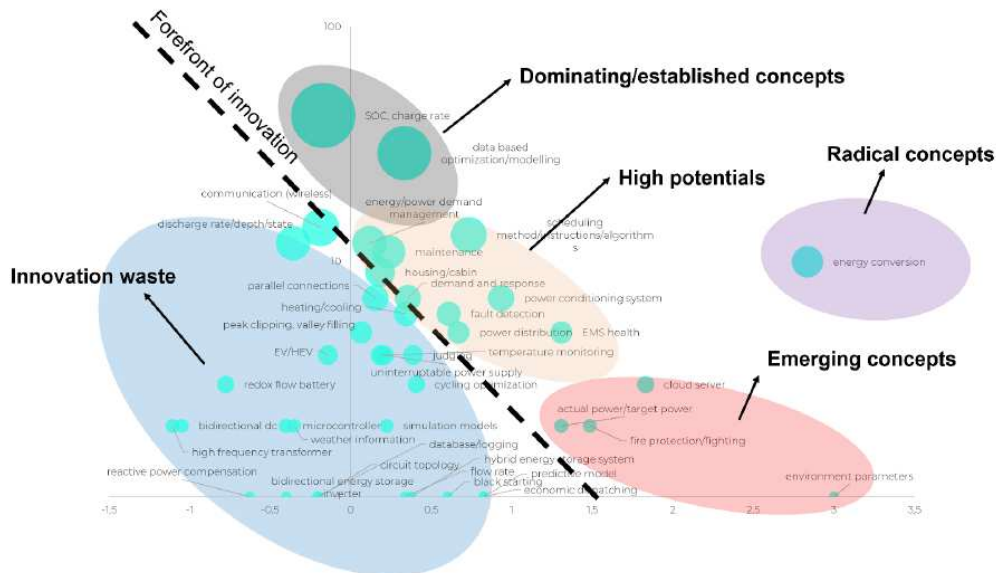
WITHOUT



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By leveraging an unsupervised methodology, the model identifies a diverse array of topics, including applications, materials, technologies, processes, properties, and functionalities. This enables analysts to discover and map concepts of interest comprehensively, without having to sift through thousands of documents or possess extensive prior knowledge. The philosophy is: "Don't form insights from the limited amount you can read; read into the insights you've uncovered."

In addition to topic classification, Mynd incorporates innovation-focused metrics such as the "recency" indicator. These metric analyses activity curves and growth rates and compares them with overall trends within the dataset. It helps quantify mainstream trends and identify declining or emerging patterns.



Trends: Recency vs Volume

This “Recency vs Volume” map (above) positions each topic by **recency X-axis** (how recently it is cited) and **size/volume Y-Axis** (how many documents cite it). The zones help interpretation: “Dominating/established” are mature, high-volume themes; “Emerging” are newer topics gaining traction; “High potentials” combine scale and momentum; and “Radical concepts” are very recent, still small, but potentially disruptive.

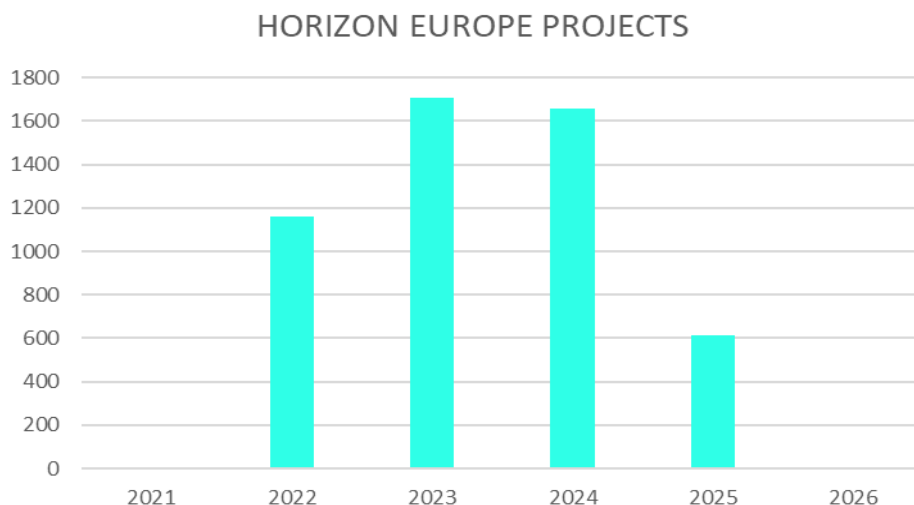
The dashed “**forefront of innovation**” line is a heuristic to spot topics with an attractive balance between novelty and impact, while the “innovation waste” area flags themes with lower strategic return versus faster-moving topics.

Important notes before reading:

All analyses in this report are designed to be highly visual and immediately interpretable. Because each figure embeds a dense amount of information that would be impractical to describe fully in text, **readers are encouraged to zoom into the visuals and explore the themes and topics detected by the analyses.**

## Trend analysis of EU-funded projects

A total of **5,150 Horizon Europe projects** with a combined funding of **18,085 billion euros** were analysed from the CORDIS database. The figure below shows how annual project activity has evolved since the launch of Horizon Europe.



The Mynd engine generated a **comprehensive topic map** from the titles and abstracts of all 5,150 projects, visually grouping coherent research themes and representing them as interconnected nodes. The resulting field map (below) provides a high-level overview of the entire Horizon Europe research landscape in Chemistry and Lifesciences.

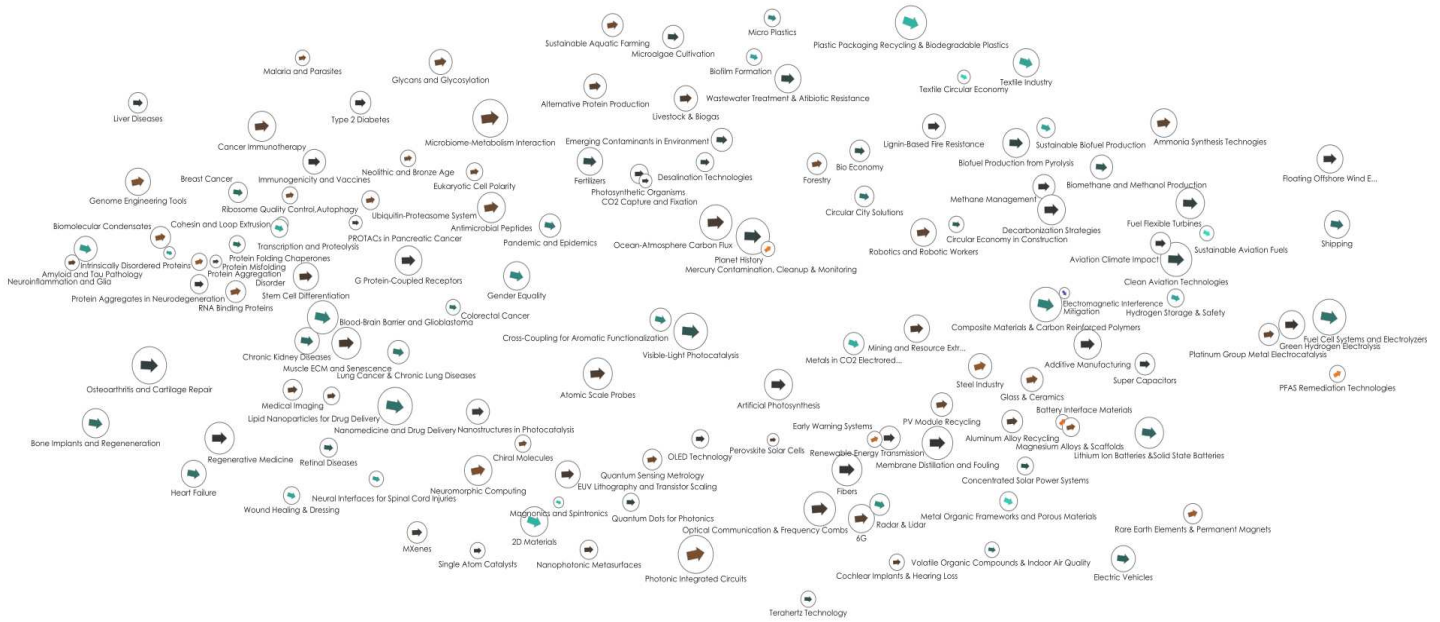
Each circle represents a topic discussed within the title or abstract of the analysed documents. The size of the circle correlates with the number of documents. The orientation and colour of the arrows indicates the publication activity of the given topic. The more publications after 2023, compared to before, the more upwards and redshifted the arrow is. The positioning of the circles is based on their context.

Mynd's algorithm generates these themes in a fully unsupervised manner (automated concept extraction and field-level quantification), providing a comprehensive yet unbiased view of what the Horizon Europe project portfolio is about.

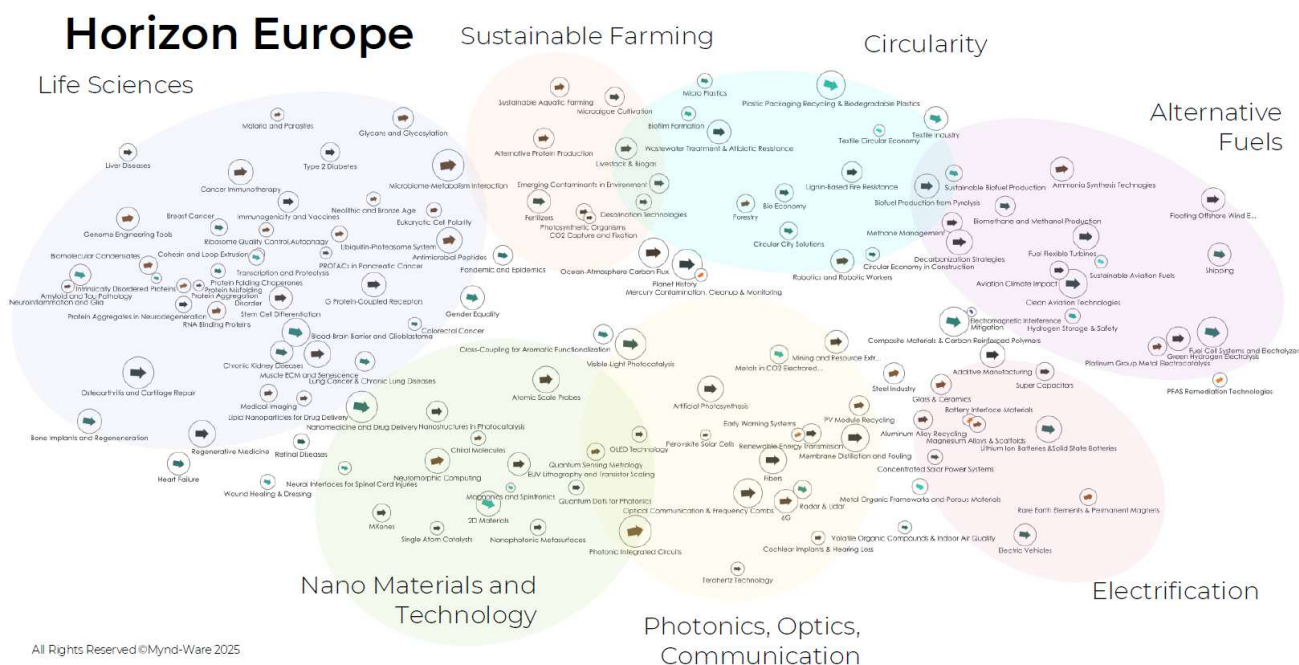
Readers are encouraged to zoom into the maps and explore the themes.

On the map, the most prominent clusters relate to life Sciences, circularity, and electrification (with additional clusters around sustainable farming, alternative fuels, nanomaterials & technology, and photonics/optics/communication).

Among the more recent signals highlighted in this landscape are themes such as sustainable aviation fuels, fuel cell systems & electrolyzers (green hydrogen), and PFAS remediation technologies.



The themes identified by the Mynd algorithm naturally group into several clear clusters on the map (see figure below).



To quantify trends within this landscape, a volume-recency scatter plot was generated (figure below). Each identified topic is plotted by its publication volume (y-axis, logarithmic scale) against its recency score (x-axis), which measures how recent the research activity is relative to the overall dataset trend.

**Readers are encouraged to zoom into the plot and explore the topics.**

Overall, the scatter plot separates high-volume, well-established topics (upper area) from more recent, lower-volume signals (towards the right and especially the bottom-right), helping distinguish “mainstream activity” from potential early-stage growth themes.

### Established / high-volume topics (top)

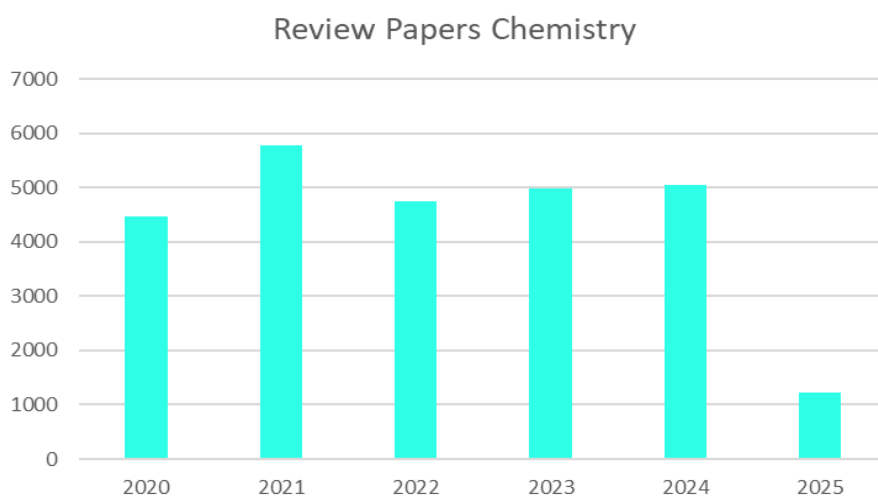
Examples of topics sitting in the upper part of the chart (high publication volume) include Cancer Immunotherapy, Microbiome–Metabolism Interaction, and Osteoarthritis and Cartilage Repair, which indicates these are widely covered and structurally important in the portfolio. Additional high-volume themes such as Membrane Distillation and Fouling and Optical Communication and Frequency Combs also appear near the top, suggesting sustained and significant research intensity.



# Trend analysis in Chemistry

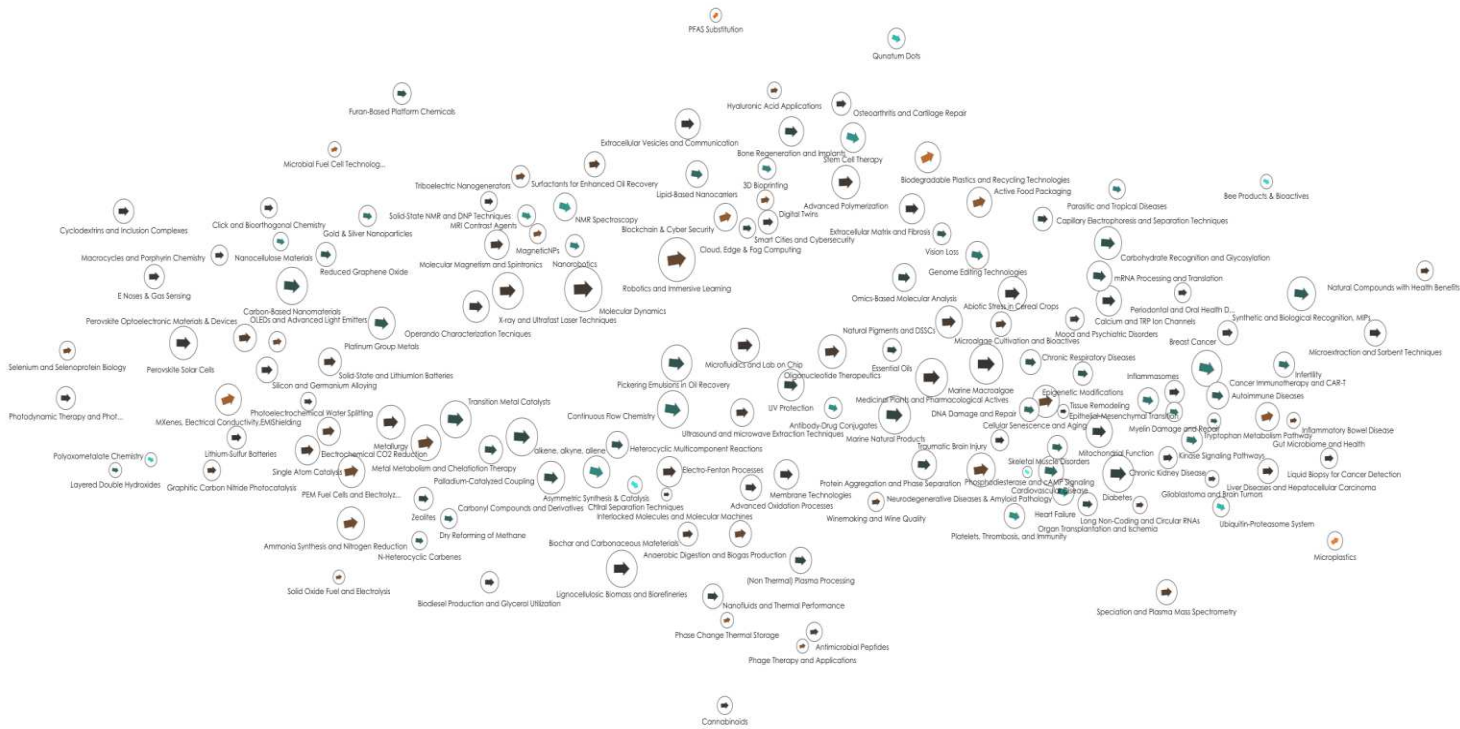
## a) Review Papers in Chemistry

A total of **26,283 review papers** were analysed from Web of Science. The figure below shows the distribution of publications by year.



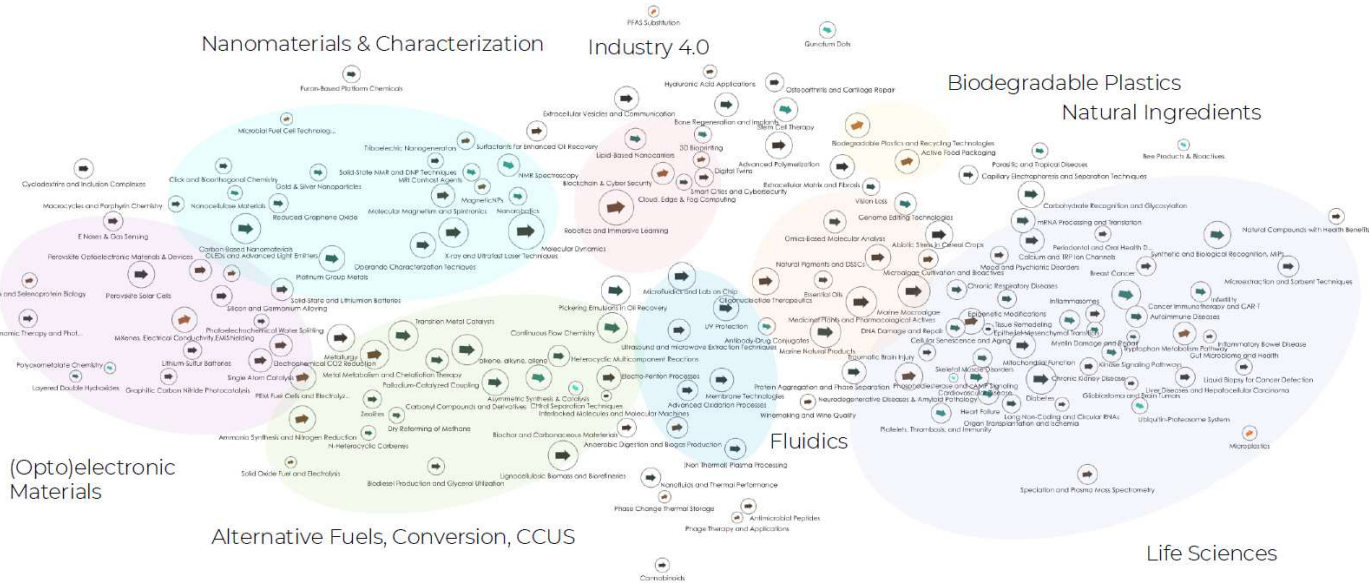
The topic network map generated from the review paper corpus (figure below) reveals a distinct landscape of research themes in scientific literature, which partially overlaps with and partially complements the Horizon Europe project landscape.

**Readers are encouraged to zoom into the maps and explore the themes.**



Same as before the themes identified by the Mynd algorithm naturally group into several clear clusters on the map (see figure below).

## Review Papers in Chemistry



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The corresponding volume-recency analysis (figure below) enables direct comparison with the Horizon Europe trends, highlighting which scientific research themes are gaining momentum in the academic literature.

**Readers are encouraged to zoom into the plot and explore the topics.**

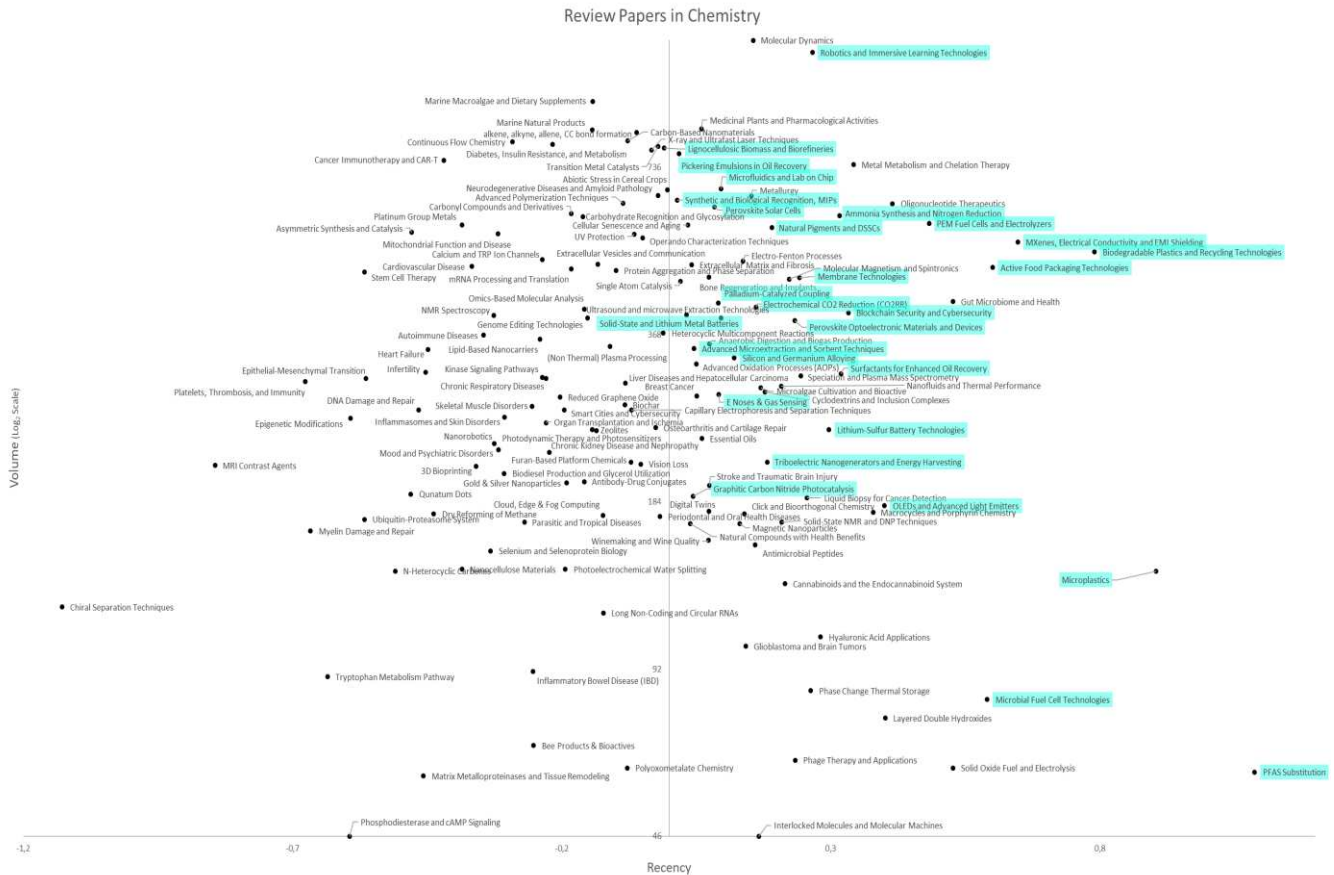
This chemistry review-paper landscape is dominated by a core set of high-volume, broadly consolidated topics (upper area), while a smaller set of right-shifted themes indicates more recent momentum and potential “next focus” areas.

#### **Established topics (high volume, top)**

At the top of the plot, themes such as Molecular Dynamics and Robotics and Immersive Learning Technologies stand out as high-volume areas, suggesting they are widely covered and structurally embedded in the review literature. Other high-volume clusters include mature enabling domains like Microfluidics and lab-on-chip (and adjacent instrumentation/materials themes), reflecting sustained, cross-cutting relevance.

#### **Emerging signals (recent, right / bottom-right)**

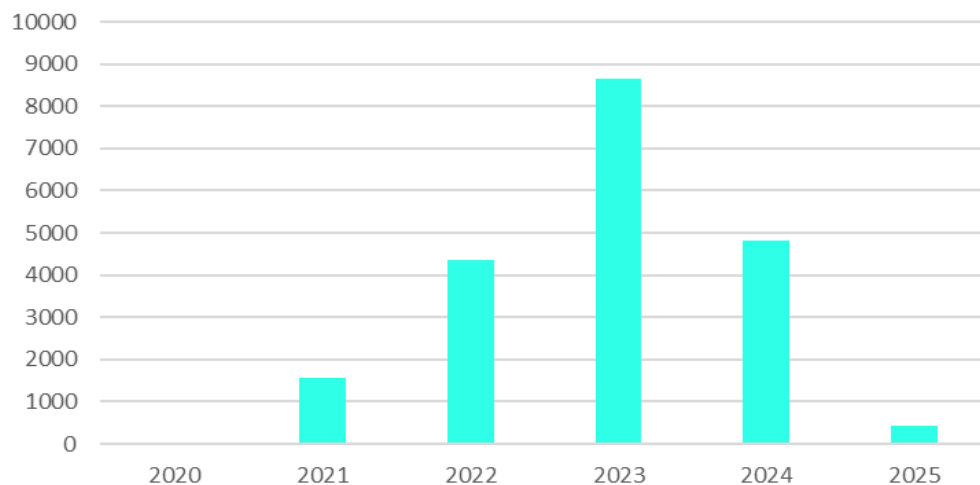
On the right, particularly the bottom-right, topics such as PFAS substitution and Microplastics appear as very recent yet still comparatively lower-volume, which is typical of early-stage or fast-rising signals. Additional recent themes like Microbial Fuel Cell Technologies also sit in this “early signal” zone, making them good candidates for targeted monitoring and deeper drill-down (key players, sub-applications, and acceleration patterns).



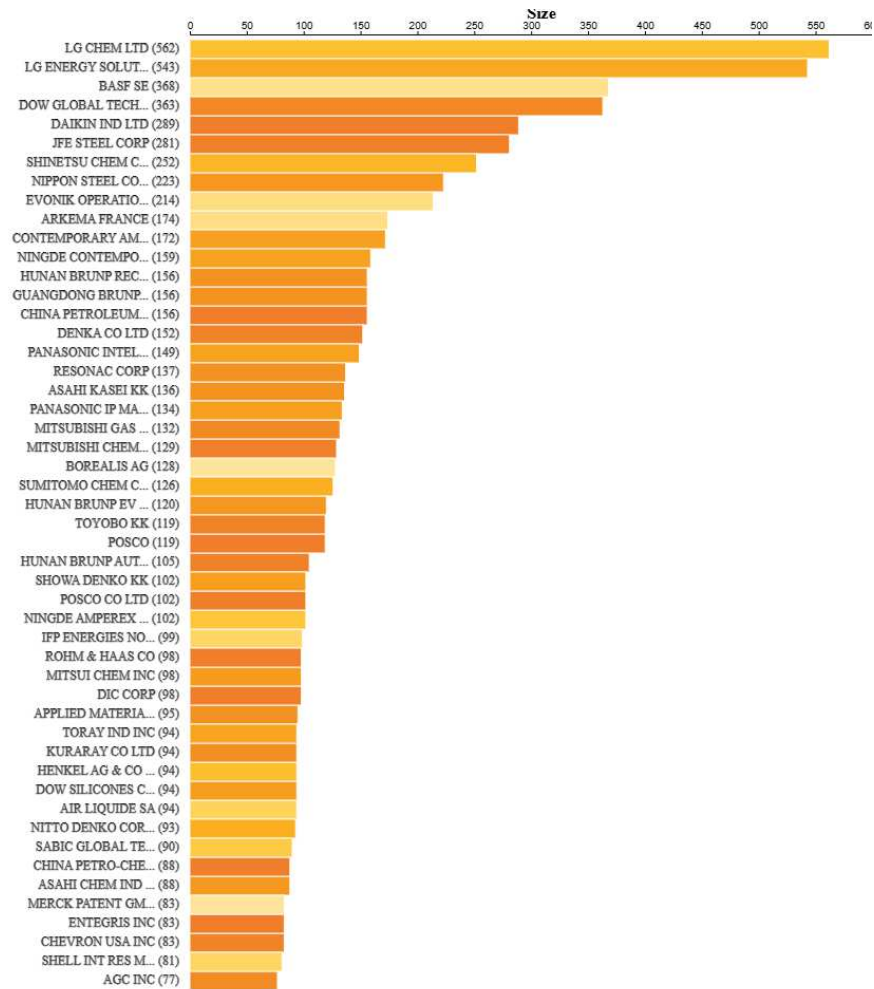
## b) Key Patents in Chemistry

The patent analysis identified key patents using CPC and IPC codes relevant to the Chemical industry, filtered for patents with at least 5 family members and at least one European filing, from 2020 onward. The figure below shows the temporal distribution of key patent publications. Overall, **19,805 patent families** were analyzed.

### Key Patents Chemistry

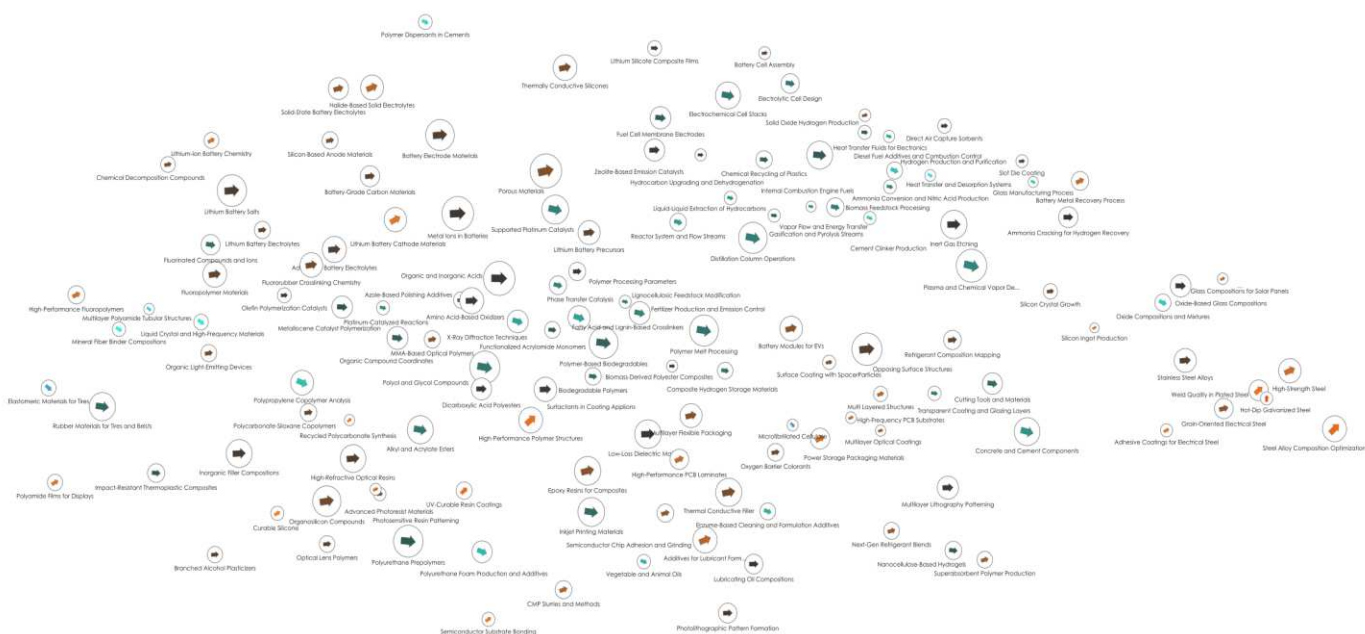


An analysis of the top patent assignees (figure below) reveals which companies ranked highest in chemical innovation for our search strategy.



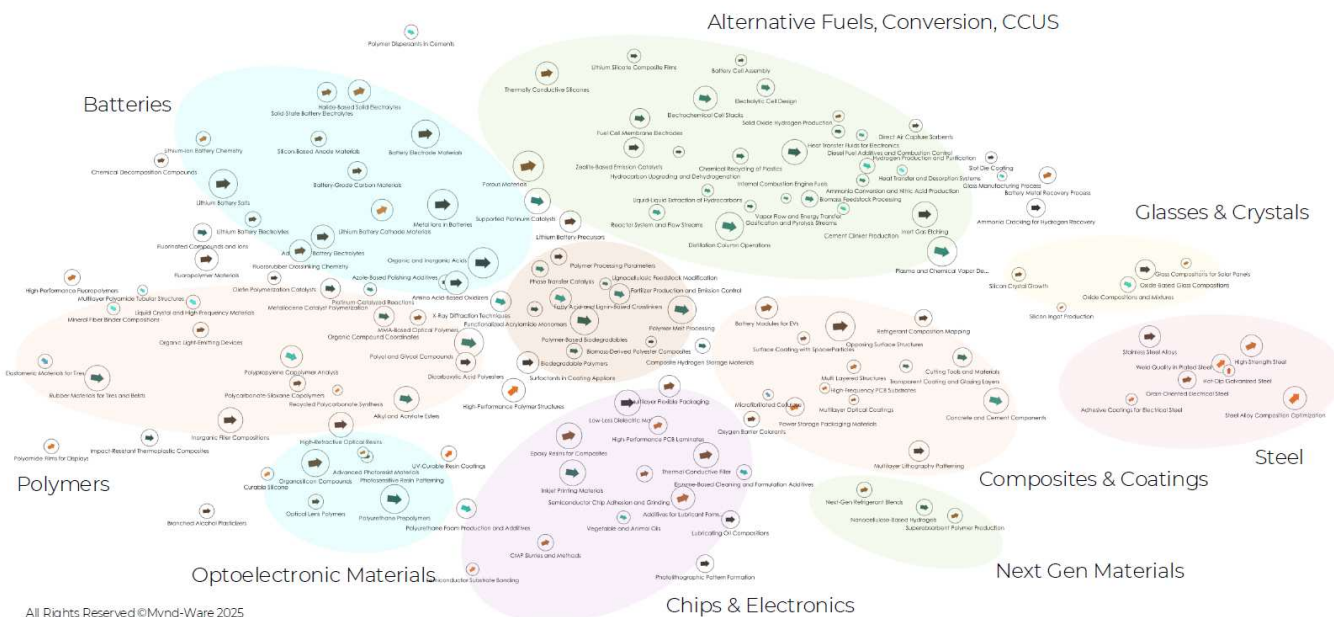
The topic network map for the patent landscape (figure below) provides a complementary view to the academic and public research perspectives, revealing which technologies are being actively protected through intellectual property.

Readers are encouraged to zoom into the maps and explore the themes.



Same as before the themes identified by the Mynd algorithm naturally group into several clear clusters on the map (see figure below).

## Key Patents in Chemistry



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The corresponding volume-recency analysis (figure below) enables direct comparison with the previous trends, highlighting which IP themes are gaining momentum.

**Readers are encouraged to zoom into the plot and explore the topics.**

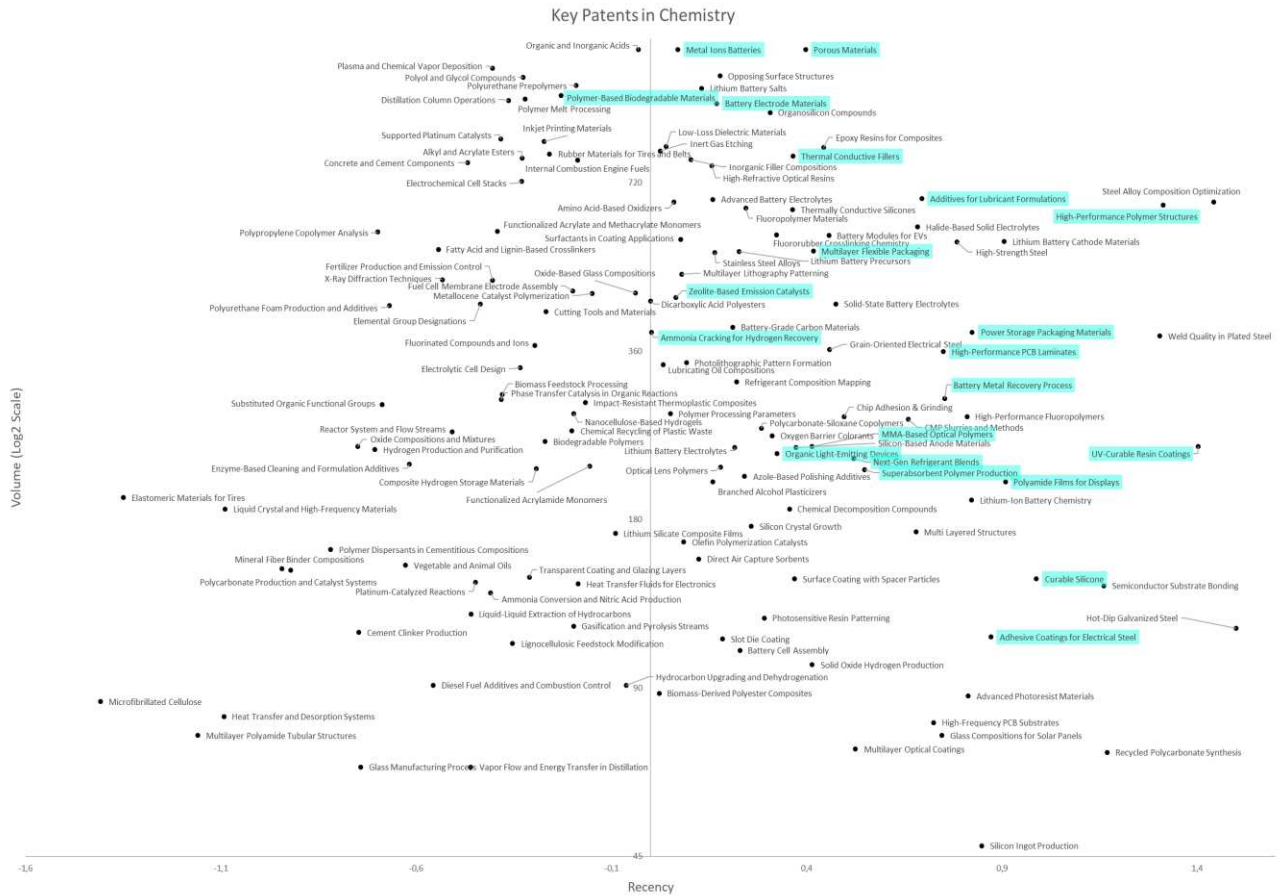
This “Key Patents in Chemistry” volume–recency plot shows a dense core of high-volume topics (upper area), alongside a smaller set of right-shifted themes that appear more recent and may represent accelerating innovation fronts.

#### **Established (high volume, top)**

Several of the most established topics sit near the top of the chart, high patenting volume and sustained activity, such as Metal-ion batteries, Porous materials, and Battery electrode materials (all positioned in the upper band).

#### **Emerging (recent, right / bottom-right)**

On the right-hand side (higher recency), the chart highlights more “recent” patent themes, typically lower volume but more momentum, such as UV-curable resin coatings, Polyimide films for displays, and Adhesive coatings for electrical steel (clustered toward the right and/or bottom-right). These are good candidates for targeted deep-dives (key assignees, claim scope, application pull, and whether the recency is sustained or a short-lived spike).



### c) Cross-Source Synthesis: Chemistry

To identify the most robust and validated trends, the topics identified from each of the three data sources were cross-referenced and harmonized. The table below presents the consolidated comparison, showing which topics appear across CORDIS, review papers, and patents.

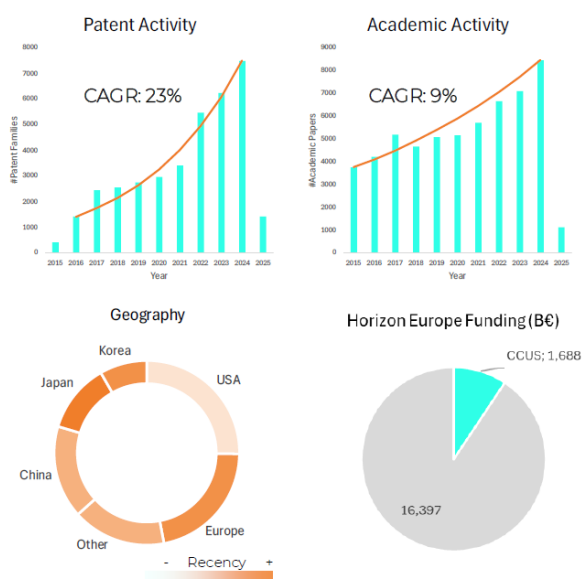
<b>CORDIS</b>	<b>Review Papers</b>	<b>Patents</b>	<b>G-A-I</b>
Photonic Integrated Circuits			
Visible-Light Photocatalysis	Graphitic Carbon Nitride Photocatalysis		
Fuel Cell Systems and Electrolyzers	PEM Fuel Cells and Electrolyzers	Fuel Cell Membrane Electrodes	Fuel Cells
Composite Materials & Carbon Fiber Reinforced Polymers			
Optical Communication and Frequency Combs			
Clean Aviation Technologies	Lignocellulosic Biomass and Biorefineries	Lignocellulosic Feedstock Modification	Biorefineries
Membrane Distillation and Fouling	Membrane Technologies		
Lithium Ion Batteries & Solid State Batteries	Lithium Sulfur, Solid-State and Lithium Metal Batteries	Metal Ion Batteries, Electrode Materials, Battery Metal Recovery	Li Ion Batteries & Materials
Atomic Scale Probes & Quantum Sensing Metrology			
Decarbonization Strategies: CCUS	Electrochemical CO2 Reduction (CORR)	Zeolite Based Emission Catalysts, Direct Air Capture Sorbents	CCUS
Artificial Photosynthesis	Natural pigments and DSSCs		Artificial Photosynthesis
Ammonia Synthesis Technologies	Ammonia Synthesis and Nitrogen Reduction	Ammonia cracking for Hydrogen Recovery	Ammonia economy
Green Hydrogen Electrolysis		Composite Hydrogen Storage Materials, Ammonia cracking for Hydrogen Recovery	Hydrogen Economy
Robotics and Robotic Workers	Robotics & Immersive Learning Technologies		
Mining and Resource Extraction			
Nanostructures in Photocatalysis			
Methane management			
PV Module Recycling			
PGM Recovery, Electrocatalysis & Substitutes	Palladium-Catalyzed Coupling, Transition Metal Catalysts	Supported Platinum Catalysts	PGM Catalysis
Mxenes	Mxenes, Electrical Conductivity and EMI Shielding		
Rare Earth Elements & Permanent Magnets			
PFAS Remediation Technologies	PFAS Substitution	High Performance Fluoropolymers	PFAS Substitution & Removal
Early Warning Systems			
Battery Interface Materials			
Mercury Contamination, Cleanup, Monitoring, Hg free			
	Molecular Dynamics		
	Enhanced Oil Recovery		
	Microfluidics, nanofluidics and Lab on Chip		
	Synthetic and Biological Recognition, MIPs		
	Perovskite Solar Cells, optoelectronic Materials & Devices		
	BioDegradable Plastics and Recycling Technologies		
	Active Food Packaging Technologies		
	Blockchain Security and Cybersecurity		
	Advanced Microextraction and Sorbent Techniques		
	Microplastics		
	Silicon and Germanium Alloying		
	E Noses & Gas Sensing		
	Triboelectric NanoGenerators and Energy Harvesting		
	OLEDs and advanced Light Emitters		
		OLED Devices, Polyamide Films for Displays	
		Additives for Lubricant Formulations	
		High Performance Polymer Structures, PCB Laminates,	
		Superabsorbent Polymers, MMA-based Optical Polymers	
		Next Gen Refrigerant Blends	

Topics that appear consistently across all three sources, such as Fuel Cells, CCUS, the Ammonia Economy, the Hydrogen Economy, and Lithium-Ion Batteries, represent the most robust areas of innovation where public research, scientific literature, and industrial patent activity are converging. These cross-validated topics form the basis for the detailed trend cards presented in the following section.

## d) Trend Cards: Chemistry

The following trend cards provide a detailed overview of the key topics identified in the Chemistry domain. Each card summarises the main research themes, technologies, and developments, along with compound annual growth rates (CAGR) derived from the analysis.

### CCUS



#### Carbon Capture, Utilization, and Storage (CCUS):

Carbon Capture, Utilization and Storage (CCUS) represents a critical set of technologies designed to mitigate climate change by reducing greenhouse gas emissions, particularly carbon dioxide (CO<sub>2</sub>), from industrial processes and energy generation. Several recent research projects focus on various aspects of CCUS, each with its unique objectives and methodologies aimed at contributing to a more sustainable economy.

**Carbon Capture Technologies:** This includes advancements in methods to capture CO<sub>2</sub> from various sources like industrial flue gases, bioenergy combustion systems and power plants. Innovative techniques such as enzymatic capture, autotrophic algae cultivation and chemical absorption are being explored to optimize efficiency and reduce costs.

**Utilization of Captured Carbon:** Research focuses on converting captured CO<sub>2</sub> into valuable products such as biocrude, biogas and chemical feedstocks. Techniques include microbial processes, electrochemical methods and hydrothermal liquefaction to transform CO<sub>2</sub> into energy-rich fuels and chemical precursors.

**Storage Solutions:** The development of safe and effective methods for CO<sub>2</sub> storage, including geological sequestration and its incorporation into construction materials is vital. This includes the exploration of carbon mineralization and the creation of sustainable construction products that utilize captured CO<sub>2</sub>.

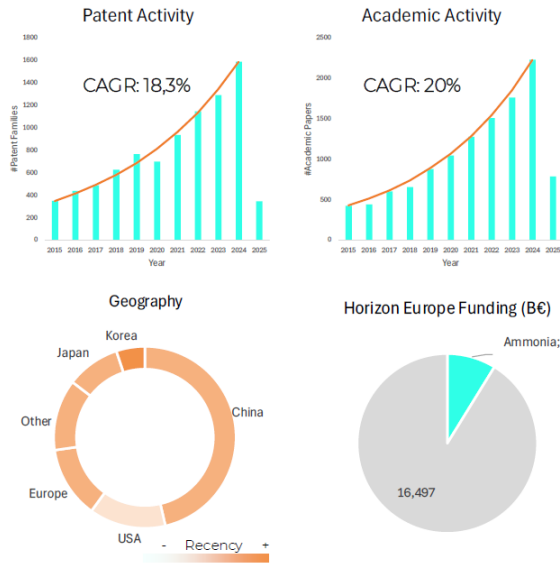
**Sustainability Assessments:** Projects emphasize evaluating the environmental, economic and social implications of CCUS technologies, including lifecycle assessments (LCA), economic viability studies and public awareness campaigns to enhance stakeholder involvement.

**Integration with Renewable Energy:** Exploring how to leverage variable renewable energy sources and surplus energy for carbon capture processes, effectively closing the loop between renewable power generation and carbon management.

Industry Impact: .../5

Stakeholder Impact: .../5

# Ammonia Economy



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Research on the ammonia economy is primarily focused on developing sustainable and efficient methods for producing ammonia, a key chemical for fertilizers and an emerging energy carrier. Traditional methods, such as the Haber-Bosch process, are energy intensive and produce greenhouse gas emissions, prompting a need for greener alternatives.

Several innovative technologies are currently scrutinized in development or research stages, including:

- Electrochemical Nitrogen Reduction Reaction (e-NRR):** This method utilizes lithium or potassium-mediated processes to convert nitrogen into ammonia at ambient conditions, addressing challenges such as nitrogen solubility and dependence on critical raw materials.
- Ammonia cracking Technologies:** These technologies focus on decomposing ammonia into hydrogen, which can be used as a clean energy source. Innovations include catalytic membrane reactors that enhance purification and efficiency while lowering operational costs.
- Photoelectrochemical (PEC) Production:** Utilizing solar energy to drive the conversion of nitrogen to ammonia through hybrid heterostructures, leveraging light and catalysis for simplicity and efficiency in production.
- Solid Oxide Fuel Cells (SOFC):** These cells utilize ammonia as a fuel, combining ammonia cracking with fuel cell technology to generate electricity with high efficiency, supporting decentralized power generation.
- Biotechnological Approaches:** Employing enzymes for fatty amine synthesis from biomass, aiming to create sustainable processes that work efficiently under mild conditions.
- Structured Catalysis:** Development of non-noble metal catalysts for ammonia synthesis at lower temperatures and pressures, enhancing efficiency and reducing costs.

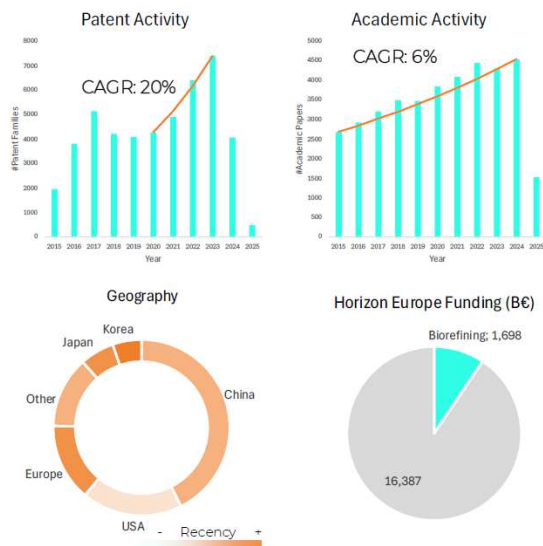
The main drivers for these developments are environmental sustainability, efficiency improvement (cost and energy effective processes to make ammonia economy viable on a larger scale), Energy security (Ammonia as hydrogen carrier to address storage and transport challenges associated with hydrogen) and market demand (growing need for fertilizers and renewable energy)

Industry Impact: .../5      Stakeholder Impact: .../5

CONTEXT MINING



# Biorefineries



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The research on biorefineries and biomass conversion focuses on developing sustainable processes that convert biomass into value-added products, such as fuels, chemicals, and materials. This research aims to address environmental concerns, reduce dependence on fossil fuels, and contribute to a circular economy.

Main Technologies Being Explored:

- Thermochemical Conversion:** This includes processes like gasification, pyrolysis, and torrefaction that convert biomass into syngas, bio-oils, and biochar.
- Biochemical Conversion:** This involves fermentation and enzymatic processes to convert biomass into biofuels (e.g., bioethanol, biogas) and biochemicals.
- Microbial Electrosynthesis:** This technology is being developed to convert CO<sub>2</sub> and organic residues into liquid fuels and chemicals using engineered microorganisms.
- Supercritical Fluid Processing:** Employing supercritical fluids to extract valuable compounds from biomass effectively.
- Integrated Biorefinery Approaches:** Combining various processing technologies to maximize the value extraction from biomass.

The feedstocks and end products for biorefineries can vary widely, and current research is emphasizing:

- Lignocellulosic Biomass:** Using wood, straw, and other plant materials that are often more sustainable than food crops.
- Waste Biomass:** Utilizing agricultural residues, food waste, and other organic wastes to produce energy and bioproducts.
- Algae:** Researching microalgae and macroalgae as feedstocks due to their high lipid content and ability to capture CO<sub>2</sub>.
- Non-food Biomass:** Exploring non-edible plant sources to mitigate competition with food production.

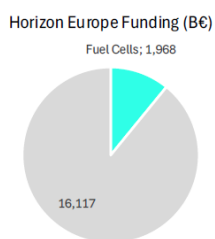
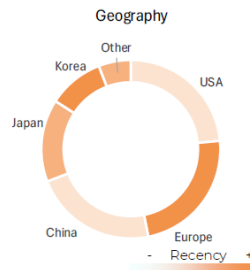
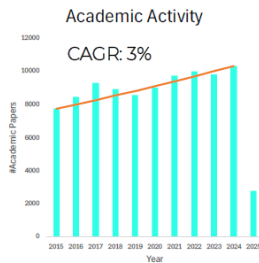
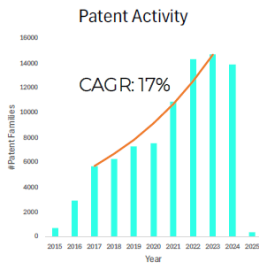
Research additionally addresses sustainability through life cycle assessments, economic feasibility, policy impacts, and stakeholder engagement to support the practical adoption and societal acceptance of biorefinery technologies.

Industry Impact: .../5      Stakeholder Impact: .../5

CONTEXT MINING



# Fuel Cells



Fuel cell technology has emerged as a critical area of research and development due to its potential to provide clean, efficient, and sustainable energy solutions. The focus of current research projects encompasses various aspects of fuel cell technologies, aiming to enhance performance, sustainability, and economic viability.

**Performance Improvement:** Enhancing the power density, efficiency, and operational conditions of fuel cells includes advancements in: **Novel catalysts and membranes** designed for improved performance and durability at varied operational temperatures. Innovative **thermal management and heat exchanger designs** to optimize the overall efficiency of fuel cell systems. Development of fuel cell stacks that are capable of **multi-megawatt outputs** suitable for aviation applications.

**Sustainable Materials:** Emphasis on reducing reliance on critical raw materials (CRMs) and improving the environmental footprint. Creating CRM-free materials and architectures to minimize the use of scarce resources. Implementing eco-design guidelines and environmentally friendly manufacturing processes in the production of fuel cell components. Developing recycling techniques for the recovery and reuse of materials from decommissioned fuel cells.

**Integration with Renewable Energy Systems:** Develop systems that utilize hydrogen produced through electrolysis powered by renewable sources. Ensure that fuel cells can efficiently convert hydrogen back into electricity, thus acting as effective energy storage solutions. Explore hybrid systems that combine battery and fuel cell technologies.

**Life Cycle and Economic Assessment:** Evaluate the environmental impacts and sustainability of fuel cell technologies across their life cycle. Benchmark their performance and costs against traditional energy systems and alternatives. Analyze market viability and competitiveness to drive technology adoption.

**Addressing Challenges in Transport Sectors:** Fuel cells are particularly promising for hard-to-electrify transport sectors, such as aviation and shipping. Developing robust fuel cell power generation systems tailored for aircraft applications, including weight constraints and safety standards.

Investigating the combustion of hydrogen and alternative fuels in a fuel cell context to meet specific transportation needs.

Creating technologies that ensure compliance with stringent aviation regulations while advancing operational efficiency.

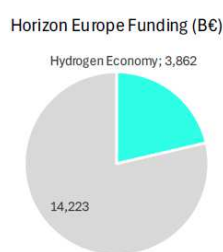
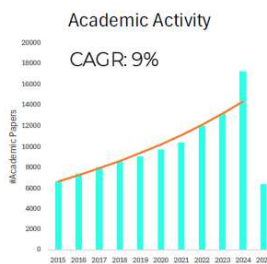
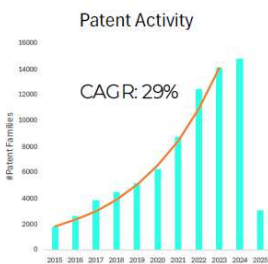
Industry Impact: .../5

Stakeholder Impact: .../5

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CONTEXT MINING  
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# Hydrogen Economy



The hydrogen economy is gaining momentum as a key player in the movement towards sustainable energy solutions. Various initiatives focus on different aspects of hydrogen production, storage, and transportation, addressing significant technological challenges to facilitate its integration into the energy market.

**Hydrogen Production** (including):

- Electrolysis:** Utilizing renewable energy sources like solar and wind power for water electrolysis has become a focus. Projects are aimed at improving electrolyser efficiency and reducing reliance on precious metals, leading to cost-effective methods for large-scale hydrogen production.
- Biotechnological Approaches:** Efforts are being made to enhance biotechnological hydrogen production using microorganisms, specifically by evolving hydrogenase enzymes to overcome challenges such as oxygen sensitivity.
- Photocatalytic Water Splitting:** Research is advancing in the use of advanced photocatalysts, including environmentally friendly nanomaterials, to optimize hydrogen yield under varying physical and chemical conditions.
- Gasification of Organic Waste:** The conversion of organic waste into hydrogen through multi-stage steam gasification is being developed to complement renewable hydrogen production methodologies.

**Hydrogen Storage** (including):

- High-Pressure Containers:** Research focuses on developing high-capacity storage systems capable of maintaining hydrogen at safe, operational pressures.
- Cryogenic Storage:** Advances in cryo-adsorptive hydrogen storage technologies, utilizing metal-organic frameworks (MOFs) for improved storage capacity and safety.
- Ammonia as a Storage Medium:** Projects are exploring the synthesis of ammonia from hydrogen for transport. This involves creating efficient catalysts to minimize resource usage and maximize production effectiveness.
- Hydrogen Carriers:** Development of novel energy carriers for hydrogen to improve storage and transport capacities.

**Hydrogen Transport** (including):

- Infrastructure Enhancements:** Initiatives aim to adapt existing natural gas pipelines for hydrogen transport, increasing safety and compatibility with current systems.
- Mobile Solutions:** Research is being conducted on mobile hydrogen delivery systems, including high-pressure trailers and filling stations that optimize efficiency during transport and distribution.
- Safety Measures:** New sensor technologies based on optical fiber sensors to continuously detect leaks and enhance safety measures throughout the hydrogen supply chain.

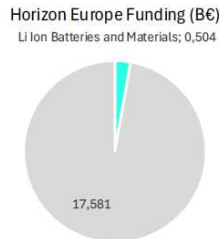
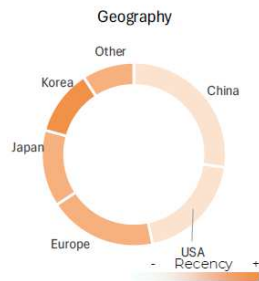
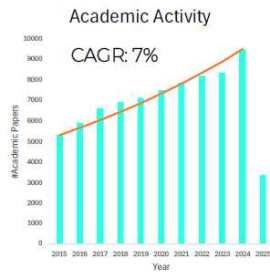
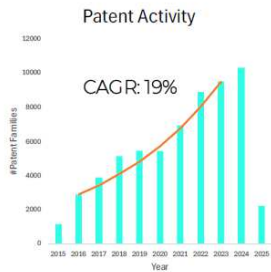
Industry Impact: .../5

Stakeholder Impact: .../5

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CONTEXT MINING  
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# Li Ion Batteries & Materials



The lithium-ion battery (Li-ion) technology, which has evolved significantly over the past 30 years, remains at the forefront of energy storage solutions. However, the escalating demands of e-mobility and a focus on sustainability have prompted a wave of innovations and alternative approaches within the field. Here are some key areas of research and development related to Li-ion batteries and their materials:

**Material Optimization and Alternative Chemistries**

- **Na-ion Batteries:** Developing sodium-based batteries (Na-ion) as a sustainable alternative to lithium, leveraging abundant resources while maintaining safety and compatibility with existing manufacturing processes.
- **Li-S Batteries:** Focusing on high theoretical capacities and exploring alternative anode materials, such as silicon, to mitigate dendrite formation and enhance safety.
- **Organic Cathodes:** Using covalent organic frameworks (COFs) to create more sustainable and high-capacity electrode materials.
- **Metal-Based Batteries:** Investigating magnesium and calcium ion batteries as potential replacements for Li-ion technology, focusing on new cathode materials.

**Improved Manufacturing Techniques**

- **Automated Production:** e.g. Automate laboratory operations to expedite materials discovery through high-throughput experimentation. This includes real-time operando techniques and application of AI to examine large datasets of results to optimize battery materials and predict performances.
- **Solid-State Batteries:** Research is moving towards solid-state batteries (SSBs) with hybrid electrolytes to enhance safety and performance while reducing flammability issues present in liquid electrolytes.
- **Scaling Up Processes:** Developing scalable and cost-effective methods for manufacturing high-silicon anodes and hybrid solid-state batteries are pivotal for achieving industry targets.

**Enhanced Safety and Sustainability**

- **Self-Healing Materials:** Incorporation of self-healing concepts to enhance the reliability and lifespan of battery components.
- **Recycling Innovations:** e.g. Integrated recycling systems to recover lithium from various sources, reducing dependency on mined materials.
- **Green Chemistry:** Developing new chemical processes that minimize waste and environmental impact during battery production.

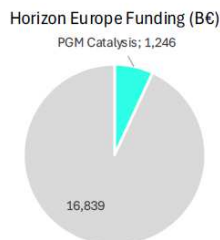
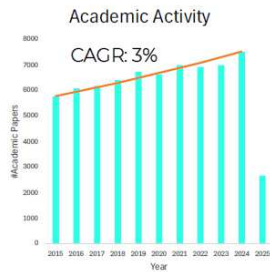
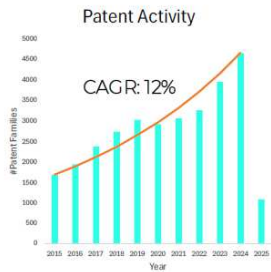
Industry Impact: .../5

Stakeholder Impact: .../5

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# PGM Catalysis



Platinum Group Metals (PGMs), including Pt, Pd, Rh, Ru, Ir and Os, play a crucial role in catalysis due to their unique properties. Their catalytic capabilities are indispensable in various high-demand applications, including chemical transformations essential for pharmaceutical production, environmental sustainability, and energy generation. PGMs are particularly valued for their ability to facilitate complex reactions, improving efficiency and selectivity in chemical processes. As global demand for these metals continues to rise, issues of sustainability, toxicity, and supply constraints due to geopolitical factors and market fluctuations present significant challenges for industries reliant on these precious materials.

**Alternative Catalysts:** To mitigate reliance on PGMs, researchers are actively investigating alternatives using earth-abundant materials. Innovations focus on the development of transition metal catalysts, particularly utilizing first-row transition metals like nickel (Ni) and iron (Fe), which can demonstrate comparable catalytic properties with improved sustainability.

**Novel Extraction and Recovery Techniques:** Recent studies have explored efficient extraction methods for recovering PGMs from spent catalysts and other waste materials. Techniques involving deep eutectic solvents, as well as advanced electrowinning processes, are under investigation to enhance yield and reduce environmental impact during recycling.

**Photocatalysis and Plasmonic Catalysts:** New approaches such as photocatalysis, leveraging the unique optical properties of nanostructured catalysts, are being explored to enhance reaction efficiency and selectivity. Plasmonic metal nanoparticles can provide enhanced activation of chemical bonds, enabling reactions under milder conditions.

**Co-catalyst Systems and Combinations:** Research also focuses on creating synergies between PGMs and other catalysts or ligands to enhance catalytic activity and selectivity. For example, hybrid systems combining main group elements with PGMs are being examined to unlock new reactivity patterns and broaden application scopes.

Applications of PGM catalysis span a wide array of industrial processes, including:

- **Pharmaceutical synthesis,** particularly in the production of anticancer drugs and other biologically active compounds.
- **Environmental catalysis** for the reduction of harmful emissions from industrial processes and automotive systems.
- **Energy conversion technologies** such as hydrogen production through water splitting and CO<sub>2</sub> reduction.

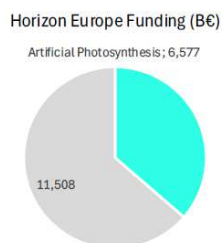
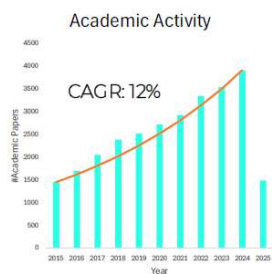
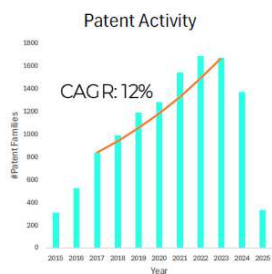
Industry Impact: .../5

Stakeholder Impact: .../5

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# Artificial Photosynthesis



Artificial photosynthesis is a cutting-edge field focused on mimicking the natural process by which plants and microorganisms convert sunlight into chemical energy. This innovative approach aims to address numerous global challenges, including energy sustainability, carbon dioxide reduction, and food security.

**Concept and Mechanisms:**

**Hybrid Systems** Researchers are combining non-photosynthetic microorganisms with organic photosensitizers to create hybrid systems that produce valuable chemicals like acetic acid and methane utilizing solar energy.

**Catalytic Innovations** Advancements in earth-abundant catalytic materials aim to enhance the efficiency of converting solar energy into usable fuels, such as hydrogen and methanol.

**Photosystem Mimics** Development of synthetic organelles that mimic the function of natural plastids and co2 enzyme organelles to improve carbon fixation and energy conversion rates.

**Technological Applications:**

**Photocatalytic Flow Reactors** Projects focus on building scalable reactors for green hydrogen production alongside oxygen reduction, seeking to provide both energy and value-added products.

**Photo-Driven Chemical Production** Systems are being designed to produce essential chemicals under environmentally benign conditions, utilizing advanced biochemical pathways and solar energy.

**Integration with Existing Infrastructure** Development of processes that can be incorporated into industrial systems to produce chemicals sustainably while improving energy independence.

**Investigation of Plant Systems:**

**Excitation Energy Management** Studies focus on how natural systems manage light stress and energy dissipation, applying these principles to enhance the efficiency of synthetic systems.

**Cyanobacteria Utilization** Research aims to utilize cyanobacteria, known for their oxygenic photosynthesis abilities, to produce biochemicals like biofuels and bioplastics more sustainably.

**Enhancing Photosynthetic Pathways** Exploration of metabolic pathways in plants to optimize their photosynthetic efficiency, offering insights that could be applied in engineered systems.

**Environmental Impact and Sustainability:**

**CO2 Sequestration** Innovations focus on integrating carbon dioxide reduction into energy systems, thus contributing to lower atmospheric CO2 levels.

**Biobased Production Systems** Shifting production processes to "green" methods using only solar energy and CO2, minimizing environmental footprints.

**Market Viability** Ensuring the technology is economically viable by addressing market needs and potential barriers, facilitating wider adoption. future.

Industry Impact: .../5

Stakeholder Impact: .../5

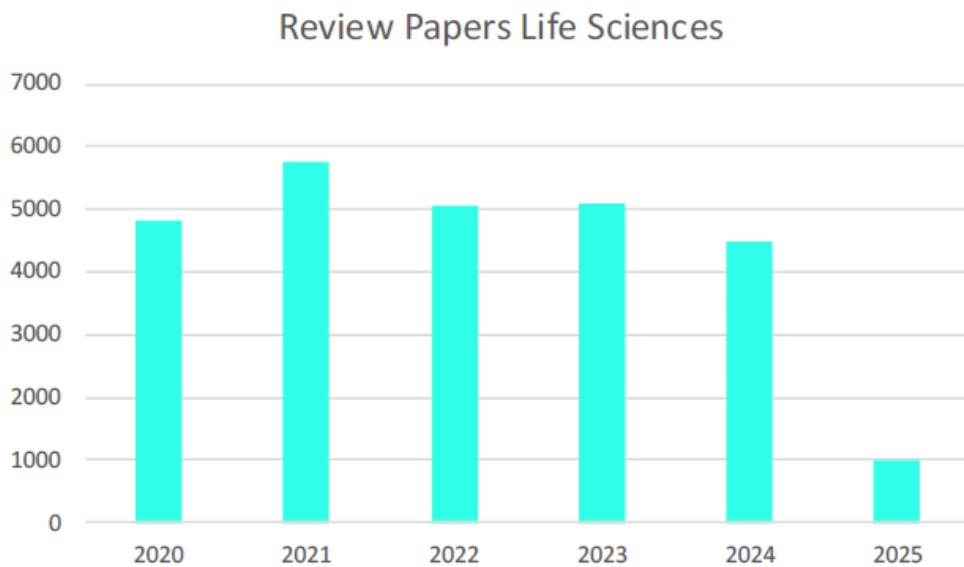
CONTEXT MINING



# Trend Analysis in Life Sciences

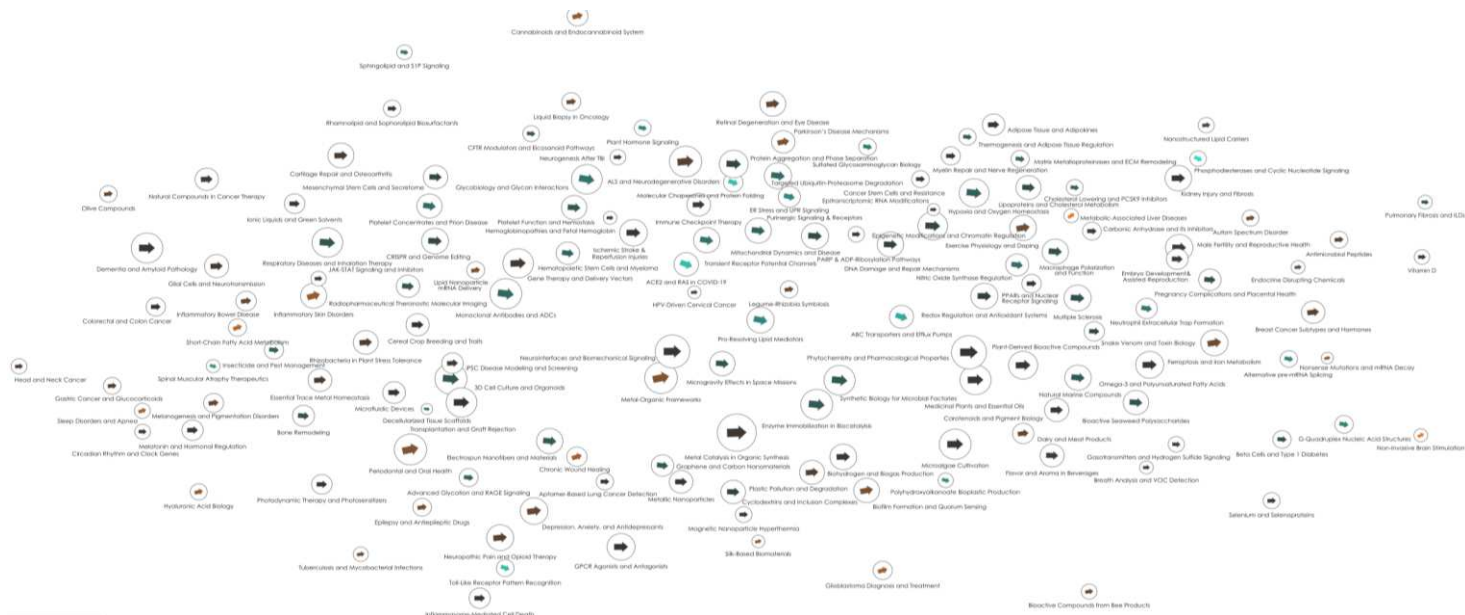
## a) Review Papers in Life Sciences

A total of **26,203 review papers** were analysed from Web of Science. The figure below shows the distribution of publications by year.



The Life Sciences review paper corpus was analyzed using the same methodology, with topic maps and volume-recency plots generated to identify trends in the scientific literature.

Readers are encouraged to zoom into the map and explore the themes.



The life-sciences review-paper scatter plot (figure below) highlights a mature core of high-volume topics (upper area) alongside a set of more recent, lower-volume signals (right and bottom-right) that may indicate accelerating or newly consolidating themes.

Readers are encouraged to zoom into the plot and explore the topics.

### Established topics (top)

High-volume themes at the top of the chart include, for example, Protein Aggregation and Phase Separation, Medicinal Chemistry and Drug Discovery, and ALS and Neurodegenerative Disorders, suggesting these are well-established and widely covered across the review literature.

### Emerging signals (right / bottom-right)

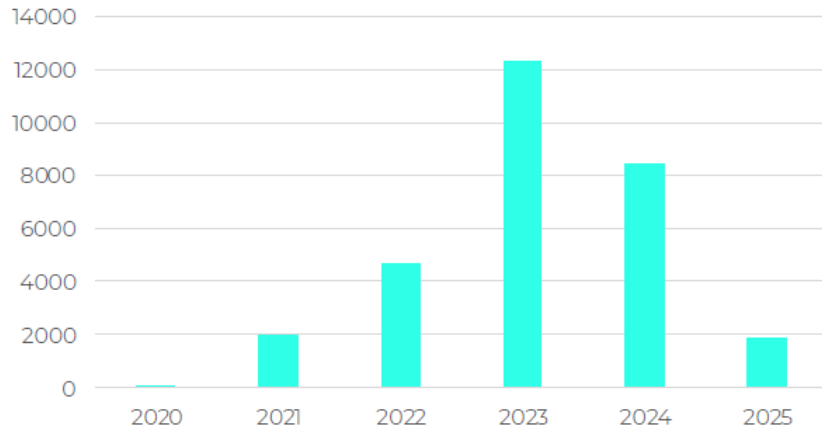
More recent topics sit toward the right, and the clearest early-signal zone is the bottom-right (high recency, lower volume). Examples here include Metabolic-Associated Liver Diseases, Non-invasive Brain Stimulation, and Sleep Disorders and Apnea, which look comparatively newer in this dataset and are good candidates for targeted monitoring and deeper drill-down.



## b) Key Patents in Life Sciences

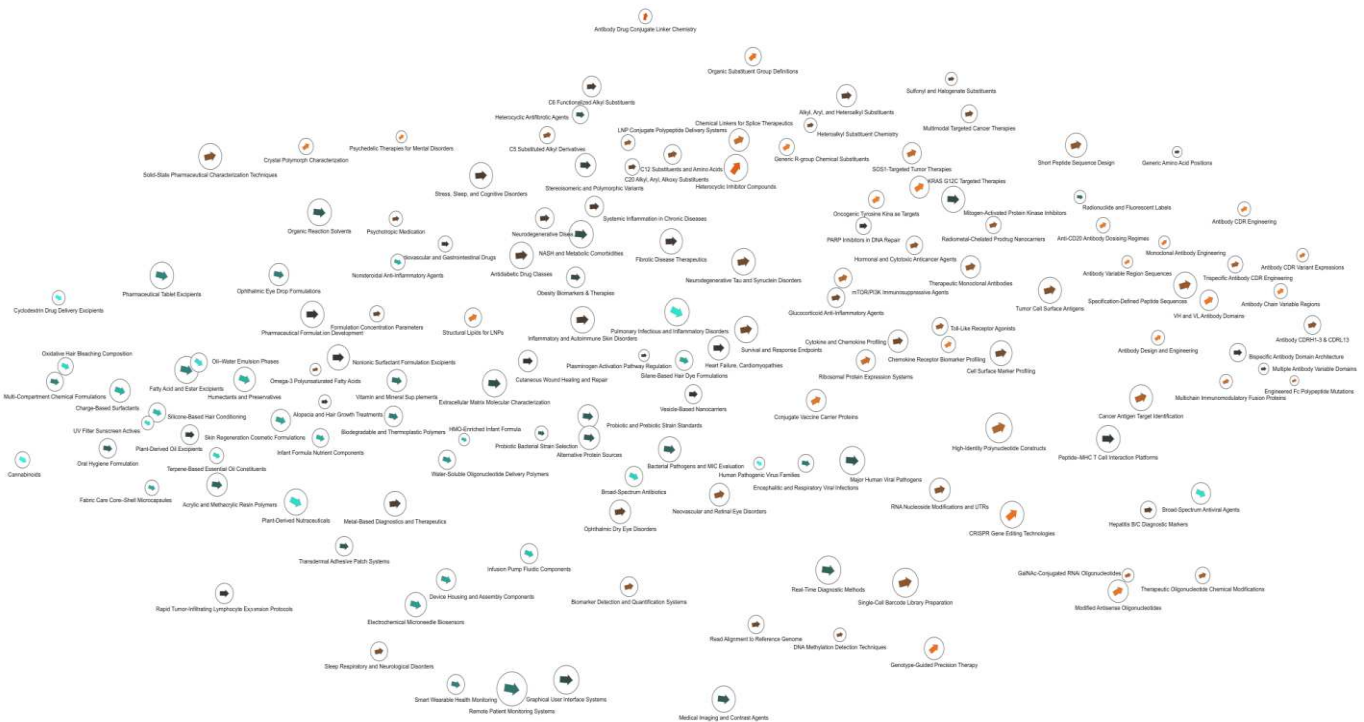
The patent analysis identified key patents using CPC and IPC codes relevant to the Chemical industry (A01P, A61K, A61P, G06F19, Y02A5), filtered for patents with at least 5 family members and at least one European filing, from 2020 onward. Figure 16 shows the temporal distribution of key patent publications. Overall **24,630 patent families** were analyzed.

# Key Life Sciences Patents



The topic network map for the patent landscape (figure below) provides a complementary view to the academic and public research perspectives, revealing which technologies are being actively protected through intellectual property.

Readers are encouraged to zoom into the maps and explore the themes.





## c) Cross-Source Synthesis: Life Sciences

As with the Chemistry analysis, the topics identified from each data source were cross-referenced and harmonised to identify the most robust and cross-validated trends. The table below presents the consolidated comparison for Life Sciences.

CORDIS	REVIEW PAPERS	PATENTS	HARMONISED FIELD TITLE
Microalgae Cultivation; Sustainable Aquatic Farming	Microalgae Cultivation		Algae & Aquatic Bioproducts
Alternative Protein Production	Dairy and Meat Products		Alternative Protein Production
Antimicrobial Peptides	Antimicrobial Peptides		Antimicrobial Peptides
Livestock & Biogas; Methane Management	Biohydrogen and Biogas Production		Bioenergy & Biogas
Cancer Immunotherapy	Liquid Biopsy in Oncology; Glioblastoma Diagnosis and Treatment	Therapeutic Monoclonal Antibodies; Peptide-MHC T Cell Interaction Platforms; Tumor Cell Surface antigens & Cancer Antigen Target Identification; Trispecific Antibody CDR Engineering; Oncogenic Tyrosine Kinase Targets; KRAS G12C Targeted Therapies; SOS1-Targeted Tumor Therapies	Cancer Immunotherapy & Targeted Therapies
Chronic Kidney Diseases	Metal Catalysis in Organic Synthesis; Metal Organic Frameworks		Catalysis & Synthetic Chemistry
G protein-Coupled Receptors	Kidney Injury & Fibrosis	Heterocyclic Inhibitor Compounds	Chronic Kidney Disease & Fibrosis G Protein-Coupled Receptors
Genome Engineering Tools	CRISPR and Genome Editing	High-Identity Polynucleotide Constructs; Modified Antisense Oligonucleotides; RNA Nucleoside Modifications and UTRs; Specification-Defined Peptide Sequences; Specification-Defined Peptide Sequences & Short Peptide Sequence Design; Genotype-Guided Precision Therapy; Ribosomal protein expression systems; Chemical linkers for splice therapeutics	Genome Editing & Gene Therapy
Glycans & Glycosylation			Glycobiology
Microbiome-Metabolism Interaction	Short-Chain Fatty Acid Metabolism; Inflammatory Bowel Disease; Biofilm Formation and Quorum Sensing		Gut Microbiome & Metabolites
Cochlear Implants & Hearing Loss			Hearing Loss & Cochlear Implants
Nanomedicine & Drug Delivery; Lipid Nanoparticles for Drug Delivery	Inflammatory Skin Disorders; Chronic Wound Healing Lipid Nanoparticles mRNA Delivery; Gene Therapy And Delivery Vectors	Inflammatory and Autoimmune Skin Disorders Structural Lipids for LNPs; LNP conjugate polypeptide delivery systems	Inflammatory Skin Disorders Lipid Nanoparticle Drug Delivery
Malaria and Parasites		Real-Time Diagnostic Methods	Liquid Biopsy & Diagnostic Biomarkers Malaria & Parasites
Medical Imaging	Depression, Anxiety and Antidepressants; Non-invasive Brain Stimulation; Sleep Disorders and Apnea	Remote patient Monitoring	Remote Diagnostics
Liver Diseases	Metabolic-Associated Liver Diseases	Stress, Sleep, and Cognitive Disorders Antidiabetic Drugs NASH and Metabolic Comorbidities	Mental Health & Neuromodulation Metabolic Disorders & Diabetes Metabolic Liver Disease & NASH
Osteoarthritis & Cartilage Repair; Bone Implants & Regeneration	Cartilage Repair and Osteoarthritis; Bone Remodeling		Musculoskeletal Regeneration
Neuroinflammation & Glia	Glial Cells and Neurotransmission	Ophthalmic Dry Eye Disorders	Neuroinflammation & Glia Ophthalmic Disorders Periodontal and Oral Health
Protein Aggregates in Neurodegeneration; Protein Aggregation disorders; Biomolecular Condensates Ubiquitination & Protein Modifications; Ribosome Quality Control, Autophagy	Periodontal and Oral Health Plant-Derived Bioactive Compounds; Phytochemistry & Pharmacological Properties	Neurodegenerative Tau and Synuclein Disorders; Neurodegenerative Disease Therapeutic Agents	Phytochemistry & Plant Bioactives Protein Aggregation & Neurodegeneration
Immunogenicity & Vaccines	Protein aggregation and Phase Separation; ALS and Neurodegenerative Disorders; Parkinson's disease Mechanisms	Single-Cell Barcode Library Preparation mTOR/PI3K Immunosuppressive Agents Conjugate Vaccine Carrier Proteins	Protein Quality Control Single-Cell Omics Transplantation & Graft Rejection Vaccines & Immunogenicity
Muscle ECM and Senescence	Transplantation & Graft Rejection		
Regenerative Medicine			
Stem Cell Differentiation			
RNA binding Proteins			
Eukaryotic Cell Polarity			
	Epitranscriptomic RNA Modifications		
	Ferroptosis and Iron Metabolism	Major Human Viral Pathogens	
	Neurointerfaces and Biomechanical Signaling	VH and VL Antibody Domains	
	Neuropathic Pain and Opioid Therapy	Hormonal and cytotoxic anticancer agents	
	Cannabinoids and Endocannabinoid System	Pharmaceutical Characterization Techniques	
	Melanogenesis and Pigmentation Disorders		
	Epilepsy and Antiepileptic Drugs		
	Hyaluronic Acid Biology		

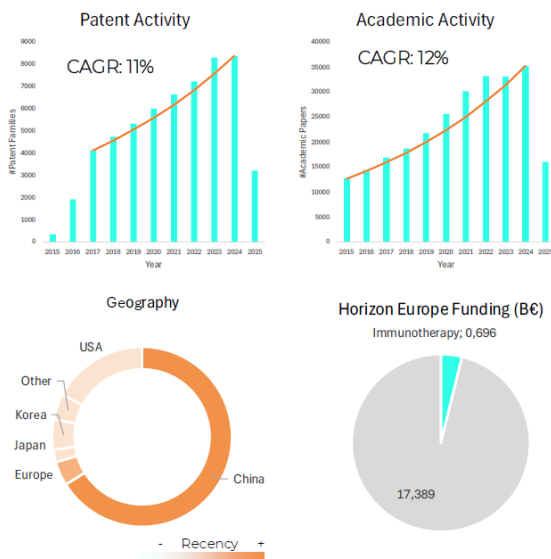
Topics appearing exclusively in one data source, such as Muscle ECM and Senescence, Regenerative Medicine, and Stem Cell Differentiation in CORDIS, or Ferroptosis and Iron Metabolism and Cannabinoids in review papers, represent more specialised niches that may warrant monitoring for future convergence. Topics validated across multiple sources, such as Cancer Immunotherapy, Genome Editing & Gene Therapy, Lipid Nanoparticle Drug Delivery, and Protein Aggregation & Neurodegeneration, form the basis for the detailed trend cards that follow.

## d) Trend Cards: Life Sciences

The following trend cards provide a detailed overview of the key topics identified in the Lifesciences domain. Each card summarises the main research themes, technologies, and developments, along with compound annual growth rates (CAGR) derived from the analysis.

### Cancer Immunotherapy

Cancer immunotherapy has emerged as a revolutionary approach in cancer treatment, leveraging the body's immune system to target and eliminate cancer cells. The growing importance of immunotherapy is reflected in the increasing number of research initiatives focusing on various aspects of this field:



**Understanding Immune Evasion:** Tumors often develop mechanisms to evade the immune system, thwarting the effectiveness of immunotherapies. Research is focused on delineating these mechanisms, particularly in solid tumors, which present unique challenges.

**Enhancing Antigen Presentation:** Effective immunotherapy relies on the immune system's ability to recognize tumor antigens. Researchers are exploring how to enhance the presentation of these neoantigens to T cells, thereby increasing the immune response.

**Development of Combination Therapies:** Single-agent immunotherapies often show limited effectiveness. Ongoing research aims to combine immunotherapies with traditional treatments (chemotherapy, radiotherapy) or novel approaches (such as photodynamic therapy) to improve outcomes.

**Nanoparticle and Delivery Systems:** Innovative strategies are being developed to utilize nanoparticles for the targeted delivery of immunotherapeutic agents. These systems aim to enhance the specificity and efficacy of treatments while minimizing side effects.

**Personalized Approaches:** The ability to tailor immunotherapies to individual patients' tumor characteristics and immune profiles is a critical focus. This includes leveraging machine learning and AI to identify suitable antigens and optimize therapeutic strategies.

**Novel Modes of Action:** Research is investigating new ways to engage the immune system, such as cell reprogramming to promote the immune activation of tumor-associated antigens, and the use of engineered immune cells like CAR T cells.

**Improving Safety and Efficacy:** Efforts are underway to reduce adverse effects associated with immunotherapies and improve patient responses. This includes studying checkpoint inhibitors and their combinatorial applications.

**Monitoring and Biomarker Development:** The identification of biomarkers that can predict responses to immunotherapy is crucial for selecting appropriate treatment strategies. Current research is focused on developing new biomarkers based on preclinical models and clinical datasets.

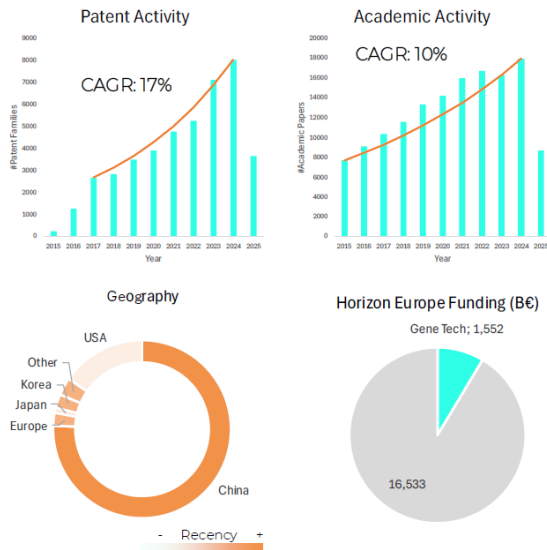
Industry Impact: .../5

Stakeholder Impact: .../5

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# Genome Editing & Gene Therapy



Genome editing and gene therapy are groundbreaking fields of research focused on addressing the fundamental causes of genetic diseases and disorders that affect millions of people worldwide. Key aspects that current research is focusing on:

**Precision and Efficiency of Gene Editing:** Researchers are striving to enhance the precision and efficiency of gene editing tools such as CRISPR-Cas systems. Approaches like prime editing, tyrosine recombinases, and the development of programmable transposases are gaining momentum, aiming to achieve large DNA insertions and precise genomic modifications.

**Delivery Mechanisms:** One of the major challenges in gene therapy is the effective delivery of gene editing tools to target cells. Current studies are focused on developing non-viral delivery systems using modified nanoparticles that minimize toxicity and improve specificity. New strategies utilizing insulin and other innovative nanoplateforms are also being explored for brain tissue specifically.

**Safety and Efficacy:** Enhancing the safety profiles of gene therapies is crucial. Research is investigating the immunogenicity and potential toxicity associated with viral delivery systems. Efforts are underway to create humanized models to predict therapeutic efficacy and reduce attrition rates in clinical trials.

**Addressing Rare Diseases:** With over 6,000 rare genetic disorders affecting millions globally, research is emphasizing the development of targeted gene therapies for these conditions. Initiatives such as the Gene Therapy of Rare Diseases (GETRADi) Consortium aim to improve the efficiency and safety of therapies by training new leaders in this field and leveraging industrial partnerships.

**Regulatory and Manufacturing Challenges:** Efforts are underway to overcome regulatory, financial, and manufacturing challenges that hinder the commercialization of gene therapies. The goal is to establish scalable production methods for gene therapy vectors to lower costs and meet the increasing demand for therapeutic interventions.

**Technological Innovations:** The creation of entirely new gene editing technologies based on viral machinery and innovative designs—such as those exploiting protein-primed DNA replication for gene delivery—exemplifies the drive to innovate. These advancements have the potential to revolutionize gene editing approaches and expand their therapeutic applications.

Industry Impact: .../5

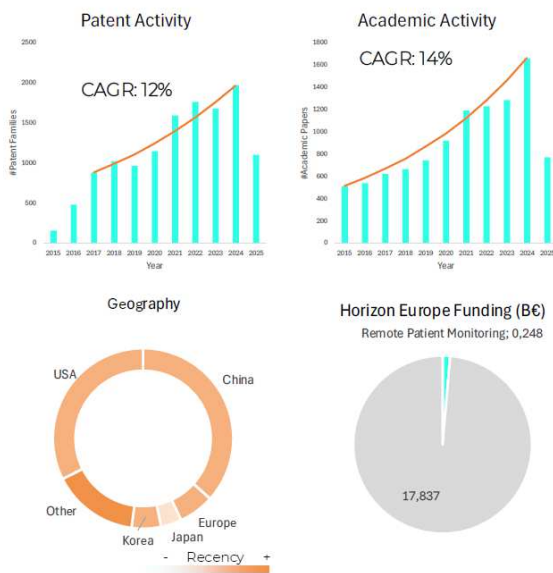
Stakeholder Impact: .../5

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# Remote Patient Monitoring



Recent advancements in remote patient monitoring (RPM) and telemedicine are pivotal components aimed at enhancing healthcare delivery, particularly in the fields of fitness and chronic condition management. Notable areas of focus in current research and development include:

**Real-time Monitoring of Health Parameters:**

Researchers are developing textile-integrated electronic systems designed for real-time monitoring of vital health parameters. These systems aim to capture critical data such as heart rate, respiratory rate, and movement metrics, applicable in various environments, including water and air.

**Integration of Advanced AI and Edge Processing:**

The incorporation of AI-based edge and cloud data processing is revolutionizing remote monitoring. These advancements enable reliable and autonomous diagnosis of body parameters through self-learning sensors capable of multi-sensing, remote updates, and integration of data from sensor arrays.

**Miniaturized and Durable Devices:**

A focus on miniaturizing devices for capturing biochemical parameters is making them more accessible for everyday health monitoring. New semiconductor technologies are being explored to ensure these devices can function in harsh conditions such as salt fog, extreme temperatures, and exposure to chlorine or detergents.

**Smart Textiles and Wearable Technology:**

The development of smart textiles, which incorporate electronic systems for continuous monitoring, is a significant area of research. These textiles can be integrated into various applications, including wearable devices such as fitness bands and sports equipment, allowing users to monitor health metrics conveniently.

**Societal Benefits:**

Significant societal benefits are anticipated from these advancements, notably in promoting healthier lifestyles. By providing affordable tools and services for health monitoring that are accessible to a larger audience, including people with disabilities, the transition to a healthier lifestyle is being supported. This democratizes access to health monitoring technology.

**Remote Healthcare Solutions:**

Research is targeting the smart remote healthcare sector, which will benefit from low-cost, microfabricated solutions for intelligent body sensors. These advancements can lead to improved patient outcomes through continuous monitoring and timely interventions.

Industry Impact: .../5

Stakeholder Impact: .../5

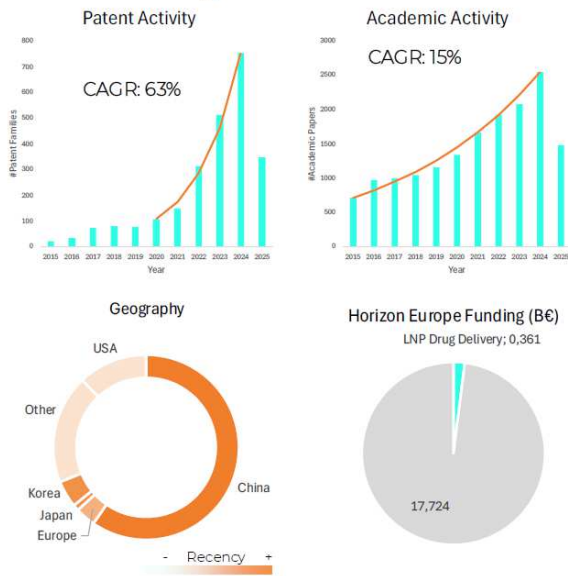
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# Lipid Nanoparticle Drug Delivery

Lipid nanoparticles (LNPs) have emerged as a powerful tool in drug delivery, particularly for therapeutic agents such as RNA, due to their ability to encapsulate complex biological molecules. Below are key aspects of LNPs currently being explored in the context of drug delivery:



## Enhanced Cellular Uptake

Researchers are focusing on improving the efficiency of LNPs in delivering RNA and other therapeutic agents into cells. Strategies include decorating LNPs with targeting ligands to enhance cellular uptake through receptor-mediated endocytosis, as well as surface modifications to improve interactions with cell membranes and increase uptake rates.

## Targeted Delivery

Targeting specific tissues or cells is crucial for maximizing therapeutic efficacy and minimizing off-target effects. Current strategies involve using targeting moieties such as antibodies or peptides to direct LNPs to specific cells, and modifying the size and charge of LNPs to influence their distribution and uptake in targeted areas.

## Overcoming Endosomal Escape Challenges

A significant limitation of LNPs is their tendency to become trapped in endosomes after cellular uptake. Research efforts are investigating the pH-sensitive properties of LNPs to promote endosomal escape, developing bifunctional phospholipids that facilitate better membrane fusion and cargo release into the cytoplasm, and creating in vitro models to study endosomal interactions and optimize formulation designs.

## Stability and Bioavailability

Improving the stability of LNPs in biological environments is fundamental for their efficacy. Efforts are aimed at formulating LNPs that maintain structural integrity and function under physiological conditions, as well as addressing the degradation of RNA and ensuring effective protection until delivery.

## Biocompatibility and Immunogenicity

As LNPs are introduced into the body, understanding their biocompatibility and potential immunogenic responses is crucial. This involves exploring formulations that minimize immune responses while maintaining therapeutic efficacy, and utilizing non-immunogenic materials for LNP composition to ensure patient safety.

## Novel Imaging and Dual-Functionality

Incorporating imaging capabilities into LNPs is being explored for real-time tracking and efficacy assessment. This includes the development of theranostic nanoparticles that combine therapeutic and imaging functions, and the utilization of fluorinated components for enhanced in vivo tracking without the need for invasive techniques.

## Scalable Production Techniques

As the demand for LNPs grows, efficient and scalable production methods are essential. Research is focused on optimizing manufacturing processes to ensure consistent quality and scalability of LNP formulations, and integrating advanced technologies for high-throughput screening of LNP characteristics.

Industry Impact: .../5

Stakeholder Impact: .../5

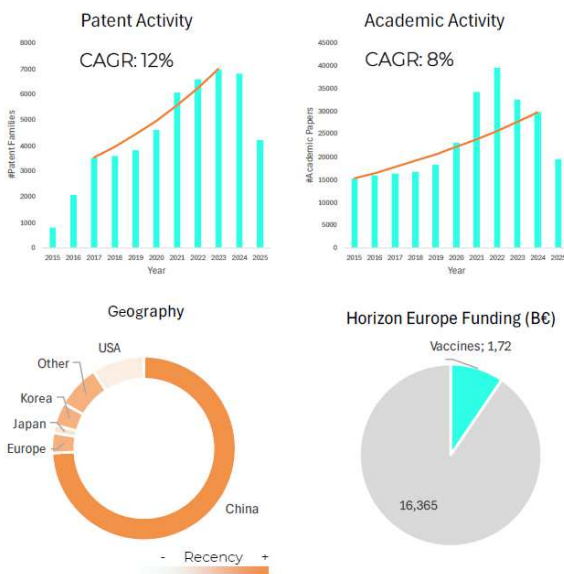
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# Vaccines & Immunogenicity

The research on vaccines and immunogenicity focuses on addressing current challenges in vaccination strategies and enhancing their effectiveness.



**Vaccine Discovery and Design:** Developing and innovating new vaccine platforms that can remain effective against emerging variants of concern.

**Immune Response Evaluation:** Conducting head-to-head assessments of immune responses generated by different vaccine platforms in preclinical models.

**Long-lasting Immunity Mechanisms:** Investigating the immune mechanisms that contribute to the durability of protection following vaccination.

**Experimental Medicine Trials:** Translating preclinical results into human trials to evaluate vaccine performance in real-world conditions.

**Data Science Integration:** Applying data science methodologies to analyze high-throughput datasets, enabling the identification of factors that influence both the quality and persistence of immune responses.

**Population Adherence:** Studying demographic factors and determinants that shape public willingness to participate in vaccination campaigns.

A particular emphasis is placed on **advancing nanovaccines**, with efforts centered on:

**Supramolecular Vaccine Design:** Modulating lipid nanoparticle formulations and their interactions with immune cells.

**Physicochemical Properties:** Understanding how size, shape, and surface characteristics of vaccine formulations affect immune outcomes.

**Flexibility of Nanovaccines:** Leveraging polymersomes as scaffolds for customizable vaccine designs that can elicit tailored immune responses.

**Cascade Signaling Pathways:** Exploring how nanoparticles interact at cellular and molecular levels to guide the development of next-generation vaccines, including applications in tumor immunotherapy.

New technologies are transforming vaccine production by making it faster, more adaptable, and more accessible.

**mRNA and self-amplifying RNA (saRNA):** faster design and updates.

**Advanced delivery systems:** improved lipid nanoparticles, intranasal and oral vaccines.

**Thermostable formulations:** less reliance on cold-chain logistics.

**Modular and localized manufacturing:** flexible plants closer to where vaccines are needed.

**AI and data-driven design:** accelerating antigen discovery and optimization.

Industry Impact: .../5

Stakeholder Impact: .../5

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# About Mynd

**Mynd transforms data into quantified and groundbreaking insights, and builds the solid ground for fact-based, strategic decision taking. Mynd applies an in-house developed topic modelling engine on textual data from any possible data source.**

As data is abundant, accessible, but often unstructured, the challenge is to transform that data into quantifiable and groundbreaking insights. Mynd takes advantage of existing knowledge to avoid re-invention, gain strategic and groundbreaking insights, discover unexpected correlations, and build a solid ground for fact-based (research-based) strategic decision taking.

The Mynd platform provides:

- Unsupervised topic modelling and analysis of massive amounts of documents in a short time, resulting in unbiased insights and discovery of the unknown.
- Smart metrics and visualisations designed to efficiently and effectively discover emerging topics, non-trivial correlations and to compare trends.
- Built by users, for users — the result of vast expertise in intelligence gathering and the unmet need for a tool for fast, complex, multi-source and unbiased discovery.

Mynd consolidates two decades of research-based innovation consultancy in a state-of-the-art context mining platform for science and technology intelligence, market and customer intelligence, competitive intelligence and intellectual property, and knowledge management.

Mynd combines both unsupervised context mining and human feedback, empowering human intelligence with artificial intelligence for unbiased and unsupervised research.

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