



Technologies

Unlocking Functional Performance
Through Nature and Science



Nature's Next Breakthrough Starts with Akay Bioactives

Today's consumers are savvy and expect more from supplements and functional foods. They look for measurable benefits they can feel, along with enjoyable taste, clean-label integrity, and compatibility with modern formats, all backed by credible scientific substantiation.

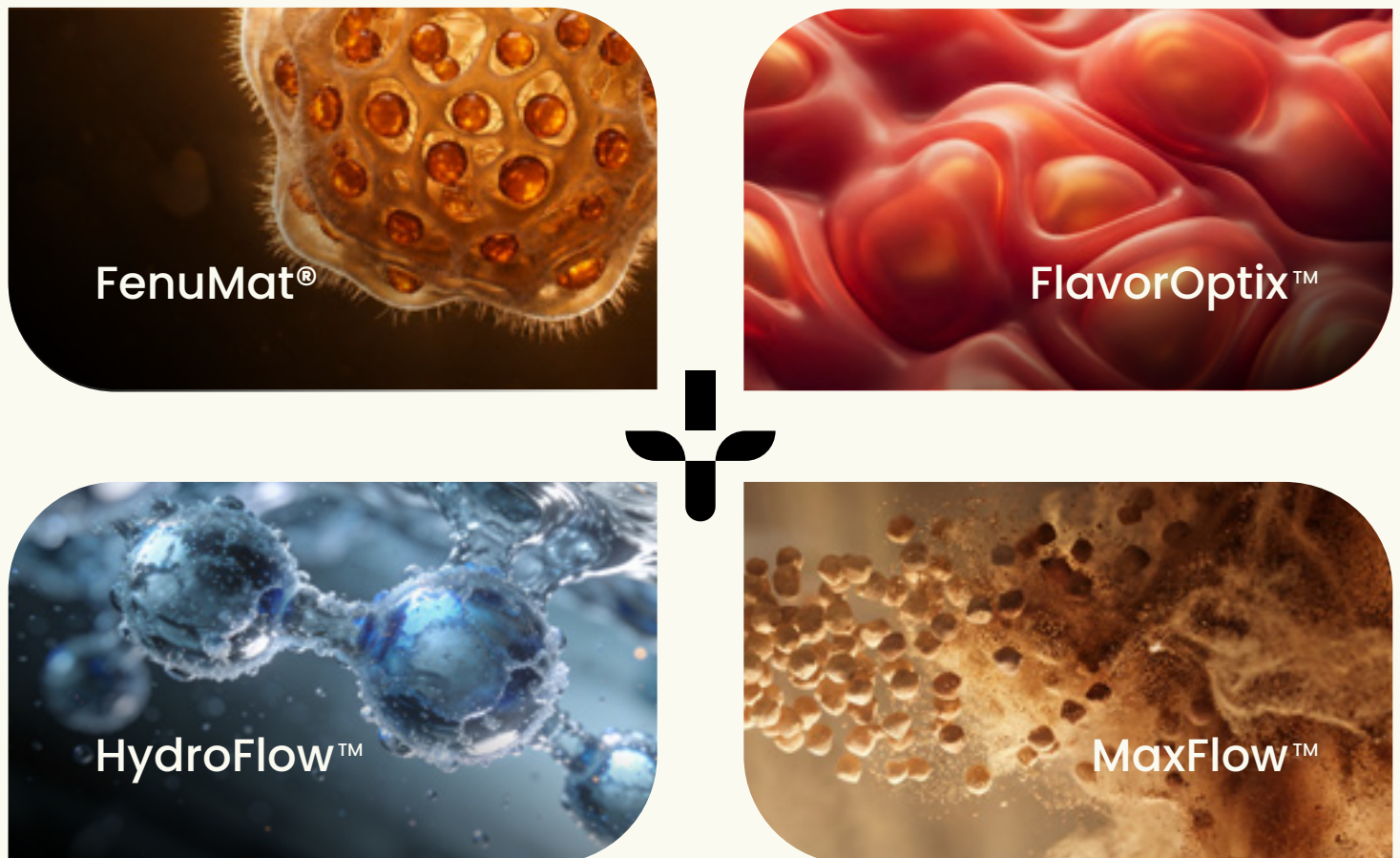
For brands and formulators, this creates a complex challenge: improving bioavailability, stability, and sensory performance while maintaining clean-label integrity and accelerating time to market.

Akay Bioactives Bridges the Gap

Our proprietary, science-driven technologies are designed for performance, enhancing nutrient delivery, expanding formulation flexibility, and elevating the sensory experience without compromising nature-first principles. By combining botanical expertise with advanced delivery science, we help partners overcome poor solubility, instability, bitterness, and format limitations.

The result is differentiated products that perform in the body, resonate with consumers, and scale efficiently from concept through commercialization.

Technology Platforms





FenuMat®



Patented self-emulsifying hydrogel technology offering a clean, plant-based nutrient delivery solution. Clinically substantiated to enhance bioactive bioavailability.

The Bioavailability Challenge



Many of today's most sought-after nutraceutical actives suffer from poor water solubility, limited absorption, and rapid metabolism into less active or weakly active metabolites. Even at high inclusion levels, meaningful systemic exposure is often difficult to achieve.

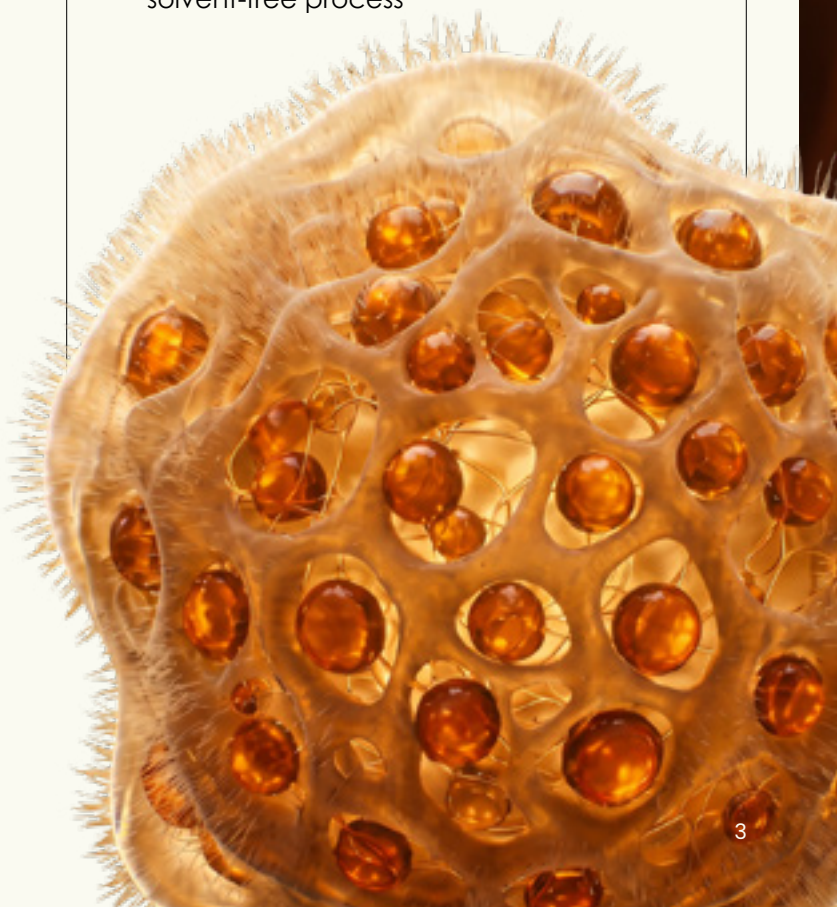
Many conventional delivery systems rely on synthetic excipients or unstable emulsions, which can complicate manufacturing, clean-label positioning, and long-term stability.

The industry needs a solution that delivers clinically meaningful performance while maintaining clean-label integrity.

Why FenuMat® Works

FenuMat helps address the most common barriers in nutraceutical delivery and is supported by 45+ randomized human clinical trials across multiple ingredient categories.

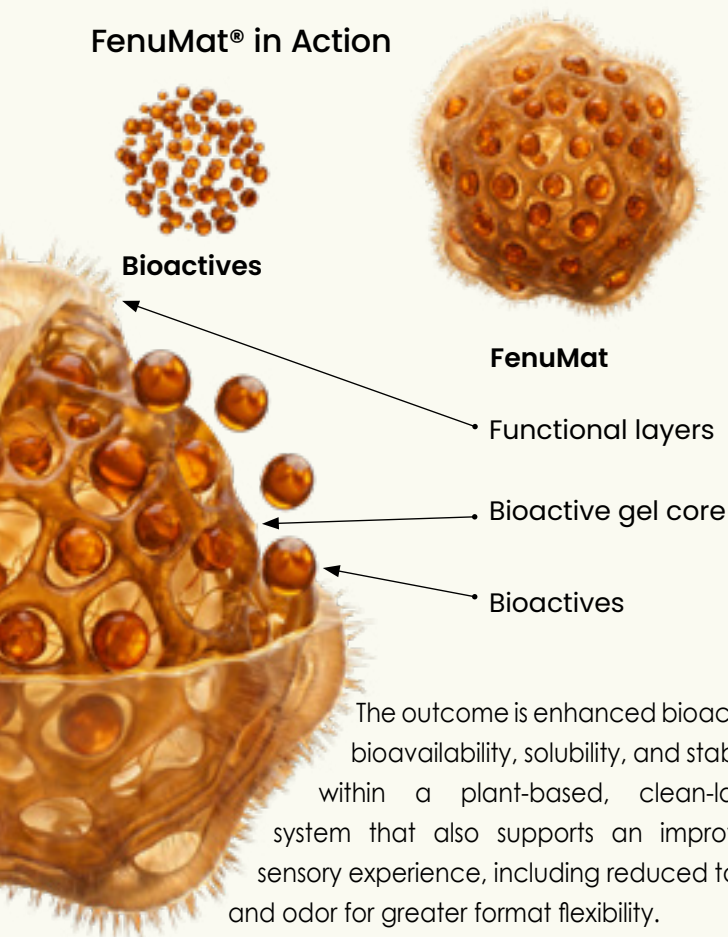
- Improves solubility, gastrointestinal compatibility, and stability of hydrophobic bioactives and oils
- Enhances systemic bioavailability to support efficacy at lower dosages
- Supports delivery of "free," unconjugated bioactive forms for greater physiological relevance
- Improves water dispersibility and supports sustained or controlled release of bioactives
- Helps protect actives through digestion with improved stability
- Converts unstable systems into scalable powder formats
- Minimizes taste and odor to improve the consumer experience
- Produced using a water-based, synthetic solvent-free process



The Akay Solution

FenuMat is Akay Bioactives' patented, nature-first delivery platform built on fenugreek seed mucilage, a galactomannan soluble dietary fiber with prebiotic properties. Using a proprietary water-based process, FenuMat forms a protective hydrogel scaffold that encapsulates oils and hydrophobic actives, and converts them into free-flowing, instantly dispersible powders.

FenuMat® in Action



45+ Human Clinical Trials

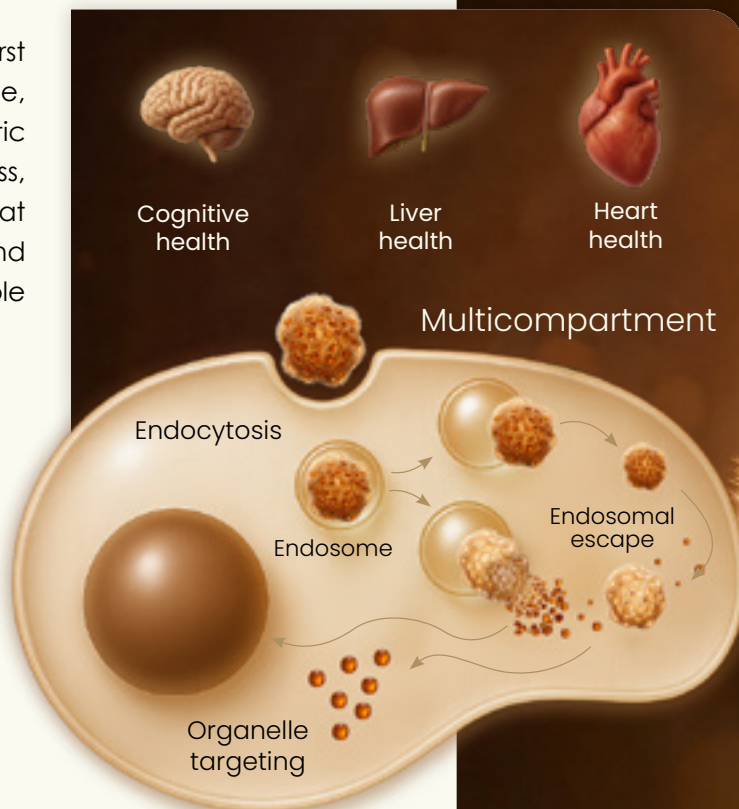
Across diverse nutraceutical ingredient categories

5x–45.5x Improved 'Free' Bioactive Bioavailability

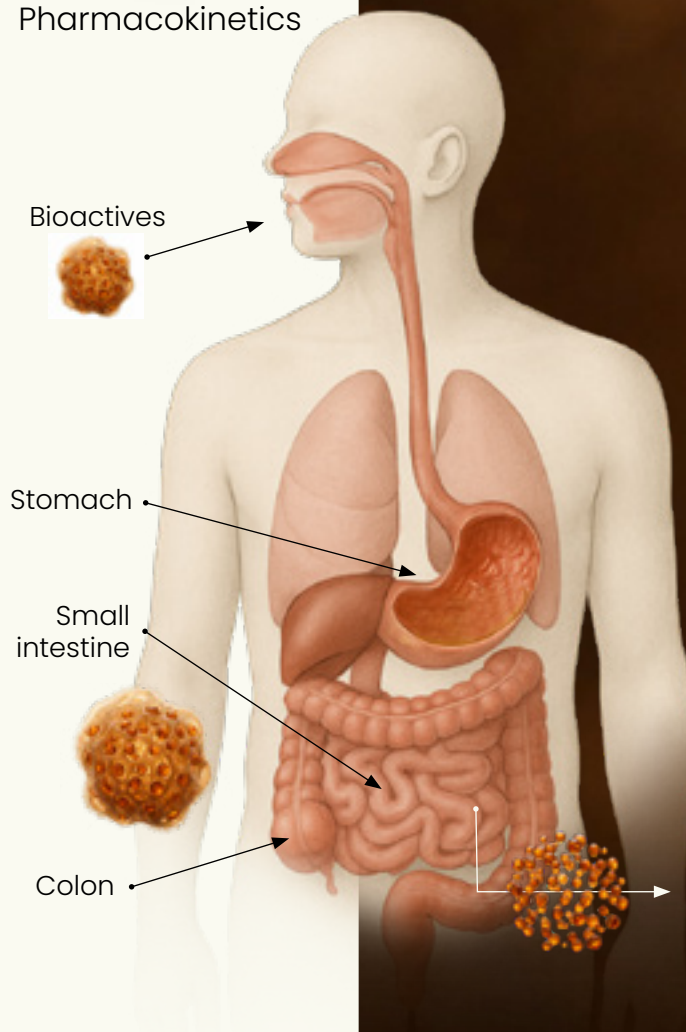
Clinically substantiated across multiple actives



Cellular Uptake & Health Benefits



Pharmacokinetics



Versatility and Applications

FenuMat is built for formulation flexibility. It supports a broad range of ingredient types and finished product formats, enabling brands to meet modern consumer expectations for convenience, sensory experience, and performance.

Ingredient Compatibility

- Botanicals and standardized extracts
- Oil-soluble actives and lipid ingredients
- Vitamins and micronutrients
- Co-delivery systems, synergistic combinations, and condition-specific formulas



Curcumin + Boswellia



Saw Palmetto Oil + Curcumin



Vitamin C + Quercetin

Suitable Delivery Formats

- Capsules and tablets
- Powder blends and stick packs
- Gummies and chews
- Functional foods

This versatility helps brands expand into trending formats while maintaining performance and clean-label positioning.



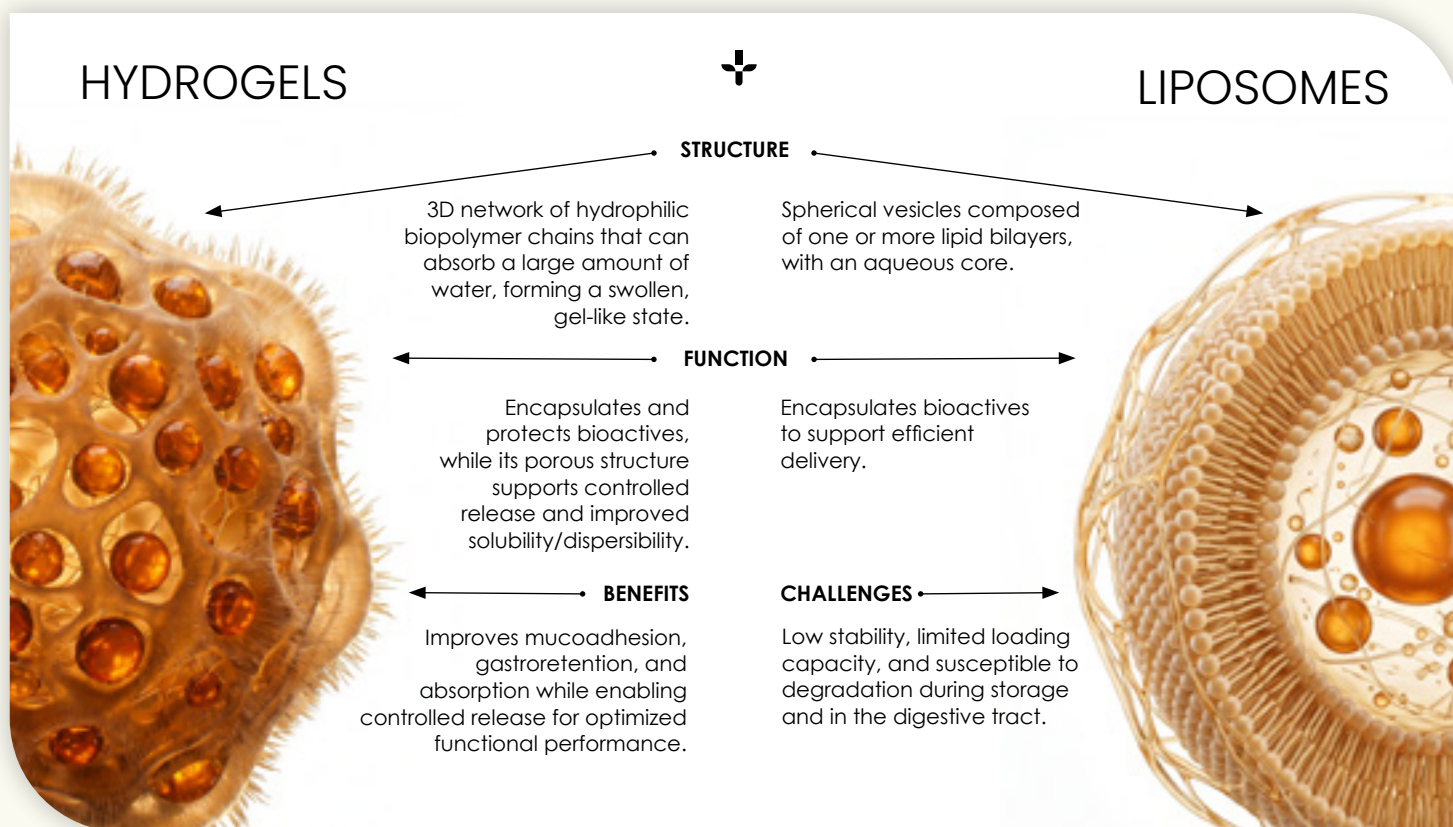
Second-Generation Hybrid-FenuMat® Technology

Advanced delivery systems such as liposomes, micelles, and nanoemulsions offer promise but often struggle with instability, aggregation, limited loading capacity, and poor shelf-life performance in oral applications.

FenuMat enables a next-level approach: improving the real-world performance of these modern delivery systems.

Hybrid-FenuMat integrates our hydrogel scaffold to:

- Stabilize lipid structures
- Reduce aggregation and phase separation
- Convert liquid systems into scalable powder formats
- Improve oral practicality and manufacturability
- Enhance sensory performance

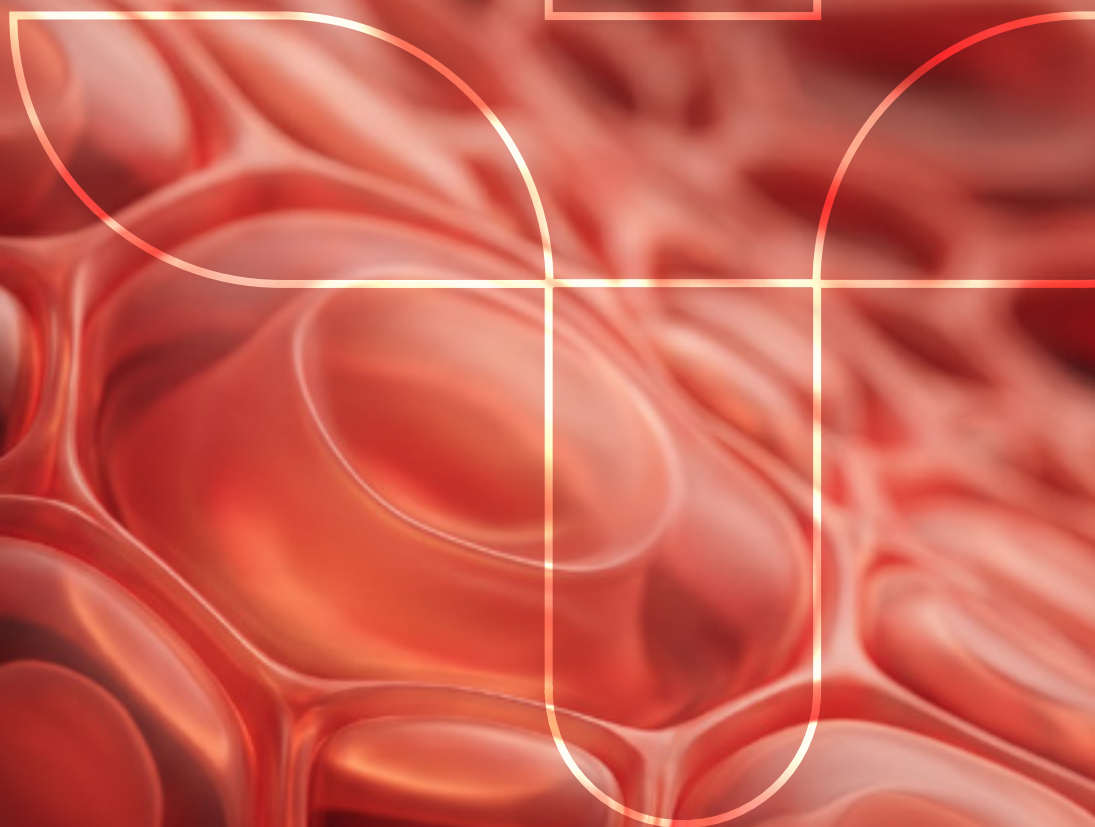


This approach preserves the innovation of modern delivery systems while strengthening their real-world stability and usability.

Key Takeaway

FenuMat is a patented, plant-based self-emulsifying hydrogel delivery platform designed to improve bioavailability, solubility, stability, and sensory performance while unlocking modern product formats. It supports a wide range of actives and applications and can enhance next-generation liposomal or micellar delivery systems, reinforcing that some innovations perform better together.

For deeper technical detail, clinical outcomes, and the mechanism of action, a full White Paper is available.



FlavorOptix™



Proprietary taste-masking technology that improves flavor, odor, and overall organoleptic performance of challenging botanical extracts across multiple nutraceutical delivery formats.

The Sensory Challenge

Even the most effective ingredients can fall short if they are bitter, earthy, or difficult to mask. Addressing these sensory challenges often requires heavy flavor systems that increase formulation complexity, dosage burden, and cost. As delivery formats expand into gummies, powders, chews, and other oral formats, taste, aroma, and texture become critical drivers of repeat purchases and brand loyalty.

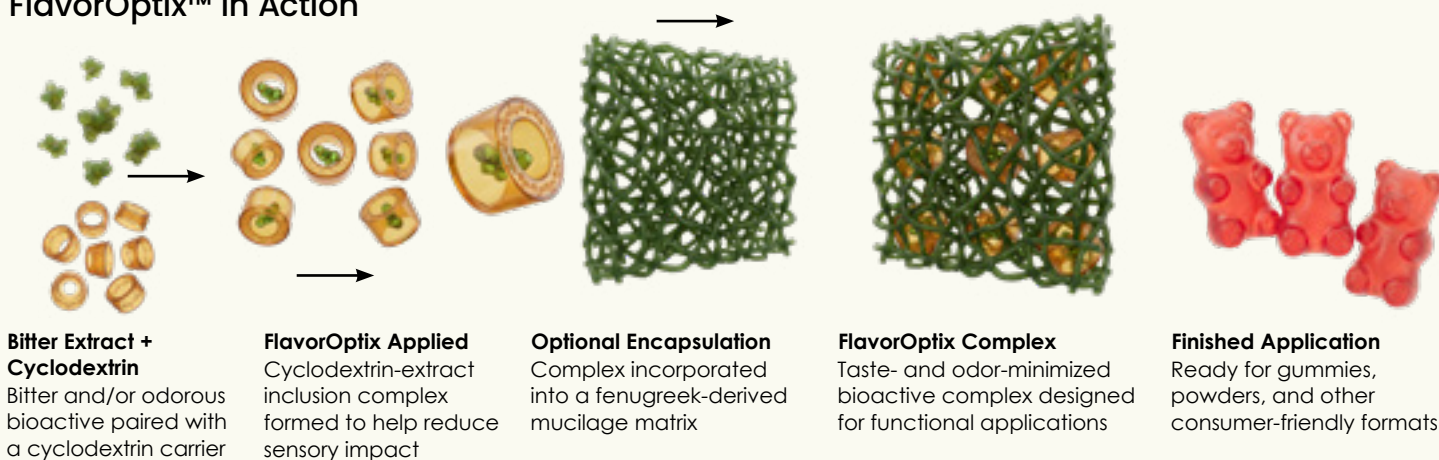
The Akay Solution

FlavorOptix is Akay Bioactives' proprietary sensory optimization technology designed to improve taste, aroma balance, and overall organoleptic performance of challenging botanicals without heavy sweeteners or artificial masking agents.

Using a plant-based, food-grade host-guest carrier system composed of cyclodextrins, with optional fenugreek mucilage encapsulation, FlavorOptix enhances organoleptic performance while also supporting water solubility, dispersibility, flowability, and bioactive stability depending on application needs.

The result is improved consumer experience and broader format flexibility across gummies, powders, chews, and other oral delivery formats.

FlavorOptix™ in Action



Applications

FlavorOptix helps botanical ingredients taste as good as they perform, transforming challenging botanicals into brand-ready solutions for consumer-friendly gummies, powders, chews, and other oral formats that support repeat purchase and brand loyalty.





HydroFlow™



HydroFlow™

Proprietary dispersibility technology that converts poorly water-soluble phytonutrients into cold-water dispersible, high-purity formats to improve wettability, mixability, and formulation performance.

The Dispersion and Solubility Challenge

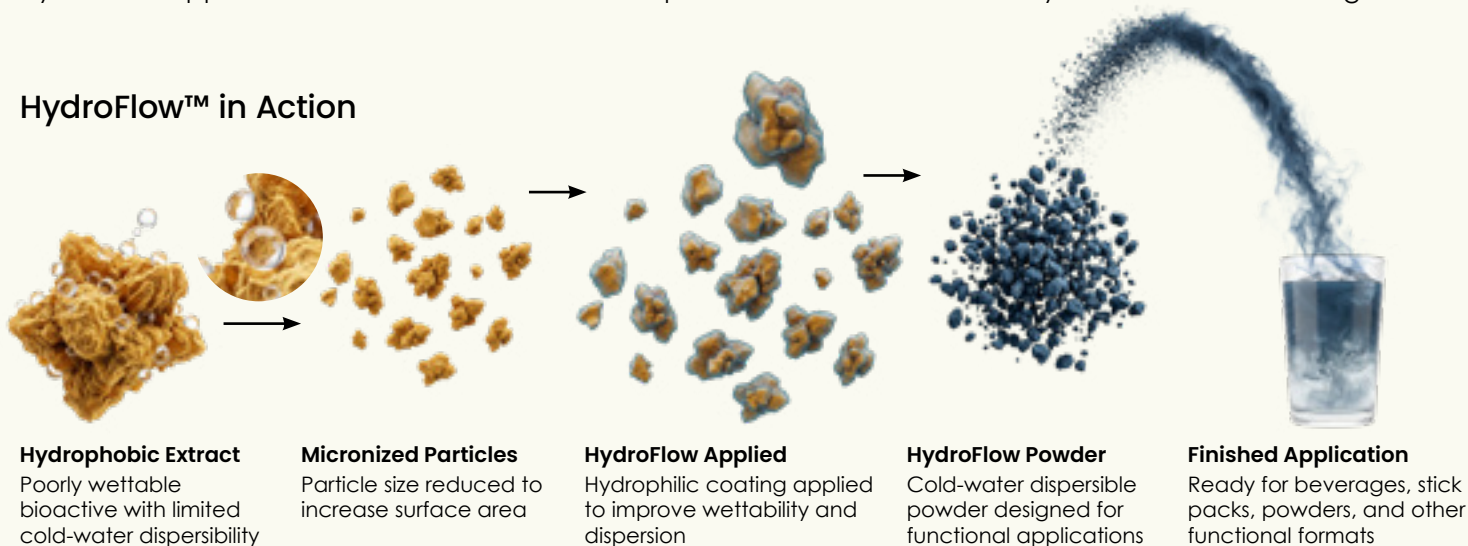
Many functional ingredients, including clinically relevant botanicals, face long-standing dispersibility and solubility challenges, including poor wettability, mixability, and stability, along with clumping or sedimentation. This limits their effectiveness in beverages and powders and complicates large-scale manufacturing, while negatively impacting the consumer experience.

The Akay Solution

HydroFlow is Akay Bioactives' proprietary dispersibility technology that converts poorly water-soluble phytonutrients into instant, cold-water dispersible, high-purity formats. Using vegan, non-GMO hydrophilic biopolymers, HydroFlow creates a uniform protective coating over micronized hydrophobic extracts, optimizing wettability, mixability, and stability while maintaining 90–95% bioactive purity.

This process improves mixability and formulation uniformity, reduces excipient load, and enhances overall formulation performance across beverages, ready-to-mix powders, gummies, and chews. Fully customizable, HydroFlow supports clean-label innovation and helps formulators work more easily with water-insoluble ingredients.

HydroFlow™ in Action



Applications

HydroFlow helps poorly water-soluble botanicals disperse as smoothly as they perform, transforming challenging hydrophobic extracts into brand-ready solutions for beverages, ready-to-mix powders, gummies, chews, and other oral formats that support mixability, uniformity, and a better consumer experience.

Why HydroFlow™ Works

- Improves wettability, dispersion speed, and mixability
- Maintains 90–95% bioactive purity to help preserve dose efficiency
- Reduces clumping and sedimentation
- Enhances formulation uniformity
- Supports scalable beverage manufacturing



MaxFlow™



Proprietary granulation technology that transforms botanical extracts into free-flowing, low-moisture granules to improve flowability, compressibility, manufacturability, and finished product quality.

The Flowability Challenge

As formulations grow more complex, poor powder flow can compromise finished product quality, reduce manufacturing efficiency, and create costly downstream challenges. Clumping, caking, and inconsistent blends can contribute to variable fill weights, dose uniformity issues, tablet friability or hardness challenges, material loss, slower throughput, and increased production waste.

The Akay Solution

MaxFlow is Akay Bioactives' proprietary granulation technology designed to transform hygroscopic, fine, or poorly flowing botanical extracts into free-flowing, low-moisture granules.

Through optimized mechanical processing and customer-specific particle size, mesh, granule profiles, and processing aids, MaxFlow improves bulk density, particle size uniformity, flowability, and direct compressibility while reducing clumping, caking, and sticking.

The result is enhanced manufacturability, improved production efficiency, and consistent finished product quality across powders, capsules, and tablets. Fully customizable, MaxFlow provides a scalable, production-ready solution for modern nutraceutical manufacturing.

MaxFlow™ in Action



Fine Powdered Extract

Fine, irregular, hygroscopic powder with poor flowability



MaxFlow Applied

Mechanical granulation using a proprietary binder system



MaxFlow Granule Powder

Dense, uniform granules with improved flowability and handling



Finished Application

Ready for capsules, tablets, powders, and other functional formats

Applications

MaxFlow helps difficult botanical powders flow as reliably as they perform, transforming challenging extracts into brand-ready granules that support easier handling, uniform blending, improved compressibility, and scalable production from formulation development to commercial manufacturing.





Unlock Nature Through Science



AKAY
BIOACTIVES

To connect with a specialist or learn more about our technologies and ingredients, visit akaybioactives.com

These statements have not been evaluated by the Food and Drug Administration.
These products are not intended to diagnose, treat, cure, or prevent any disease.