

# Austrian R&D institute offers histamine reduction process for beverages and sauces for further development with knowledge transfer potential

## Summary

Profile type

**Technology offer**

Company's country

**Austria**

POD reference

**TOAT20260216015**

Profile status

**PUBLISHED**

Type of partnership

**Research and development  
cooperation agreement**

Targeted countries

• **World**

Contact Person

**[Enrico FRANZIN](#)**

Term of validity

**16 Feb 2026**

**16 Feb 2027**

Last update

**16 Feb 2026**

## General Information

### Short summary

An Austrian R&D institute offers a process whereby magnetically recoverable, polymer-coated iron-oxide nanoparticles reduce histamine directly in drinks such as wine, beer, cider, kombucha, sake, kvass, etc., as well as in soy, fish and other fermented sauces. The particles bind histamine within minutes and are removed with a magnet, preserving flavour and line speed and bring important quality and food safety advantages. Partners are sought to further develop and fund this lab tested approach.

### Full description

Histamine spikes are a recurring quality and compliance issue in fermented/conditioned beverages (e.g., wine, beer, cider, perry, kefir, kombucha, sake, kvass, sake, palm wine, tepache etc.) and in liquid fermented sauces (e.g., soy and fish sauces). Once formed, histamine is heat-stable and difficult to correct without diluting flavour, delaying release, or installing capital-intensive separations. Excessive histamine levels can have consequences for food safety and market entry (EU criteria set sampling plans and maximum levels for some products).

Traditional levers - starter selection, storage modifications, enzymatic degradation, electrodialysis, or post-hoc analytics - either do not remove histamine already formed, risk sensory impacts, add cost/complexity, or are hard to retrofit at scale. The ideal solution is a removable, in-process adsorbent that works within beverage/sauce process windows and exits the system completely before packaging.

An Austrian R&D centre offers a short “contact-and-capture” step using superparamagnetic iron-oxide nanoparticles coated with a thin poly(acrylic-co-methacrylic acid) shell. The shell presents dense, accessible carboxylate groups that interact with positively charged histamine. After brief contact in a conditioning, blending or holding tank, the particles are cleared in seconds with a magnet and the tank is returned to production (to preserve sensory quality and line speed). The molecularly imprinted polymers (MIPs) are introduced in an aqueous suspension. The particles are chemically robust and non-flammable. These MIPs do not necessarily have to be immobilized on nanoparticles. According to a partner's preferences, the polymers can also be supported on other adsorbents, such as silica beads.

Performance depends on matrix chemistry. In food-mimicking buffers, measured maximum uptakes reached ~29 mg/g in beer-like conditions (pH ~4.4) and ~55 mg/g in soy-sauce-like conditions (pH ~5.0), while wine-like acidity (pH ~3.8) showed binding, but at reduced rates. Salts accelerate magnetic recovery and improve separation kinetics. This data defines a practical operating window for drinks and sauces and guides materials selection, dosing and residence time. Particles can be reused for multiple cycles after a desorption step. However, the binding capacity decreases depending on the environment (e.g., beer or soy sauce). Desorption protocols and regeneration strategies tailored to specific applications could be further developed with a potential partner. While reuse may be more sustainable, it is not necessarily the most cost-effective approach: the materials are not inherently expensive (they appear costly at laboratory scale, but unit costs decrease significantly at industrial scale).

A potential cooperation scenario could work as follows: using the partner's matrices (beer, cider etc.), the institute maps acidity, ionic strength, protein content and process constraints, then formulates nanoparticles for that operating window. The institute runs adsorption isotherms and kinetics in the actual liquids, engineers a short contact step followed by magnet-based clearance and clean-in-place regeneration, and verifies complete particle clearance and preserved sensory quality. Deliverables include tuned particle specifications and standard operating procedures (SOPs), adsorption and separation kinetics in the product, capacity-versus-cycle data with a regeneration protocol, quality-assurance analytics, and a plan for scaling to production. Optional modules include sensory checkpoints, hybrid strategies with enzymes earlier in the process, and digital dosing control. The work would be carried out under an NDA; project-specific results, data and materials are transferred, while the research provider retains background intellectual property.

### Advantages and innovations

- Inline, removable processing aid for beverages and fermented sauces: fast contact-and-capture with magnetic clearance; minimal equipment retrofit; no oxygen supply; no reactive by-products.
- Matrix fit where others struggle: performs in salt-containing, protein-bearing liquids (beer-range pH; soy/fish sauces). Practical adaptations are provided for low-pH wines or SO<sub>2</sub>-stabilized matrices.
- Materials tailored by design-of-experiments: optimizing polymer composition/coating thickness for binding-site accessibility, -potential and rapid magnetic separation in salty liquids.
- Compared with enzymes—diamine oxidase (DAO) and monoamine oxidase (MAO)—this approach avoids dependence on dissolved oxygen and on managing hydrogen-peroxide/aldehyde by-products; it is insensitive to sulphur-dioxide/ethanol inhibitors; and it can be combined with enzyme routes upstream if desired.
- Compared with electro dialysis/activated carbon: simpler integration, protected sensory profile, and clear physical removal before packaging with particle-clearance verification.
- Industrial readiness: supplied with SOPs at end of the project, including validated analytics, and a pilot-to-plant roadmap; modular deployment across conditioning/blending tanks for drinks and sauces.

### Technical specification or expertise sought

### Stage of development

**Lab tested**

### IPR Status

**No IPR applied**

### IPR Notes

### Sustainable Development goals

- **Goal 17: Partnerships to achieve the Goal**
- **Goal 3: Good Health and Well-being**
- **Goal 2: Zero Hunger**
- **Goal 13: Climate Action**
- **Goal 12: Responsible Consumption and Production**
- **Goal 9: Industry, Innovation and Infrastructure**

## Partner Sought

### Expected role of the partner

The non-profit Austrian R&D centre does not receive base financing. To bring magnetic histamine-reduction from lab

to market, the institute seeks an industry partner able to finance the remaining R&D and to commercialize the resulting solution. The institute's role is applied research, validation and technology transfer; the partner's role is to fund the work, steer application priorities, and to own the commercial rollout. Project-specific results, data, materials and intellectual property generated in the project are assigned to the partner; the provider retains only its pre-existing background know-how.

#### Who can partner

Any organisation able to finance development to commercialization is welcome: brand owners and co-packers (beer, cider, kombucha, sake, kvass), producers of fermented sauces (soy, fish and related), ingredient suppliers seeking a value-added processing aid, equipment OEMs integrating magnetic traps, and investors building a platform across multiple beverage/sauce categories. The Austrian organisation is open to a single lead partner or a small consortium, provided funding clarity and decision speed are ensured.

#### IP, data and rights transfer

- Assignment to the partner of all project-specific results, data, materials and IP; perpetual, unrestricted use for beverage/sauce applications as defined in the contract.
- Optional exclusivity by field, brand category or geography, if financed accordingly.
- Full IP transfer and ownership possible

The research organisation is in a position to immediately commence a joint project provided that a suitable partner can commit to funding the remaining development steps and to commercializing the technology.

#### Type of partnership

**Research and development cooperation agreement**

#### Type and size of the partner

- **SME <=10**
- **SME 50 - 249**
- **Big company**
- **SME 11-49**

## Dissemination

#### Technology keywords

- **08002003 - Safe production methods**
- **08002002 - Food Microbiology / Toxicology / Quality Control**
- **08001001 - Drink Technology**
- **08003 - Micro- and Nanotechnology related to agrofood**
- **08002001 - Detection and Analysis methods**

#### Targeted countries

- **World**

#### Market keywords

- **05008002 - Food and feed ingredients**
- **07003001 - Wine and liquors**
- **04017 - Micro- and Nanotechnology related to Biological sciences**
- **04005 - Biochemistry / Biophysics**
- **07003002 - Health food**

#### Sector groups involved