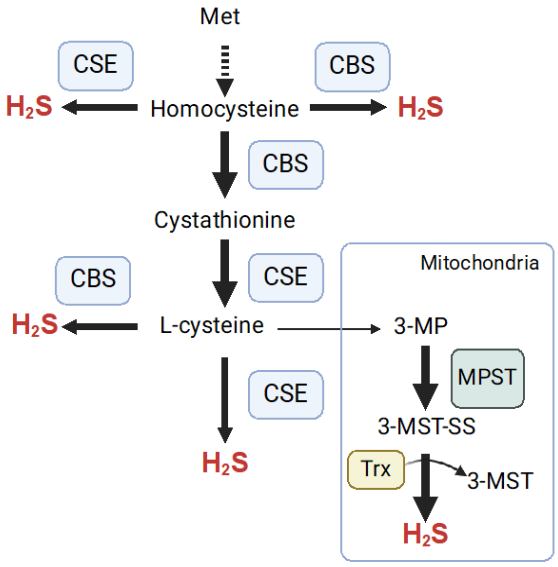

New Research Uncovers Natural Liver Defense Mechanism Against Obesity-Linked Fatty Liver Disease

Discovery offers potential new therapeutic pathway to combat MASH, a growing global health concern

Brussels, August 3, 2025 – A new study led by the **Signal Transduction and Metabolism Laboratory** of Esteban Gurzov (Maître de recherches FNRS) at **ULB**, in collaboration with the **Redox Signaling lab** at **VIB-VUB Center for Structural Biology,** led by Joris Messens (Group leader, VIB), has uncovered a critical protective mechanism in the liver that may be harnessed to combat **metabolic dysfunction–associated steatohepatitis (MASH)**—a severe, obesity-linked liver disease affecting millions worldwide.

MASH is a progressive condition that can lead to cirrhosis and liver cancer. One of its key drivers is **oxidative stress**, caused by an overload of **unstable reactive oxygen molecules** that damage liver cells. The new research highlights the protective role of **hydrogen sulfide (H_2S)**—a gas naturally produced in the body and known for its distinctive rotten egg smell.

"H_2S plays a protective role by modifying proteins through **persulfidation**, essentially tagging them to help them function properly under stress," said **Professor Joris Messens**. "But in patients and animal models with MASH, we observed a significant drop in the enzymes that produce H_2S—limiting this natural defense and potentially worsening liver injury." added **Dr. Daria Ezeriņa.**

Using state-of-the-art molecular profiling developed by **Professor Milos Filipovic** and biochemical techniques, the researchers mapped how persulfidation patterns change during disease progression. While overall protection decreased, some key proteins paradoxically increased their persulfidation levels—suggesting a targeted compensatory response by the liver.

"This discovery gives us valuable insight into how the liver tries to fight back against damage," said **Professor Esteban Gurzov**. "It also opens the door to new therapeutic approaches that aim to restore or boost this H_2S-based defense mechanism. Even under stress, the liver selectively activates protective responses—and that is something we can potentially harness for treatment."

Research Team and Support

The study was conducted by **Tzu-Keng Shen** (FNRS Aspirant and first author), **Dr. Eduardo Gilglioni** (TELEVIE Postdoctoral Fellow), **Wadsen St-Pierre Wijckmans** (FNRS Aspirant), **Bernat Elvira** (Chargé de Recherches FNRS), **Eric Trépo** (FNRS Chercheur Qualifié), and collaborators from Belgium and abroad.
The research was supported by **FNRS**, **TELEVIE**, **WELBIO**, **Fondation ULB**, **VIB**, and a **European Research Council (ERC) Consolidator Grant**. The full study was recently accepted in *Redox Biology* (Impact Factor: 11.9). Cartoon created by BioRender.