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Elkedonia: Antidepressants that act downstream of neurotransmitters

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Argobio-founded Elkedonia is investigating a first-in-class intracellular target to treat neuropsychiatric disorders, starting with treatment-resistant depression.

The company's approach is rooted in translational neuroscience research led by Jocelyne Caboche, director of research at the National Center for Scientific Research (CNRS) at Sorbonne University.

Elkedonia S.A.S. CEO Delphine Charvin completed her Ph.D. under Caboche's guidance and later reconnected with her while serving as an operating partner at Argobio S.A.S., the venture studio that helped found the company, to build a start-up around ELK1.

ELK1, a transcription factor, is important for neuroplasticity and is involved in the pathophysiology of anhedonia, the inability to feel pleasure, a core symptom of depression, said Charvin. Caboche is an expert on ELK1 and its role in different contexts, including depression, addiction and post-traumatic stress disorder.

ELK1's intracellular location in neurons stands in contrast to most classical antidepressants, which primarily act on extracellular-facing transporters or receptors for monoamine

neurotransmitters at synapses. As a transcription factor responsive to synaptic activity, ELK1 represents a downstream node in these signaling pathways.

In a 2018 *Nature Medicine* paper, a group at Sorbonne University, including Caboche, showed that ELK1 mRNA was upregulated in postmortem hippocampal tissues from depressed patients who committed suicide. In human blood samples from patients starting antidepressants, greater ELK1 reduction was associated with greater improvement of symptoms.

Elkedonia's tool compound inhibits ERK-driven activation of ELK1 by interrupting the interaction between the two proteins. The company is using its €11.25 million (\$12.85 million) seed round, announced in June, to identify a small molecule drug candidate.

The financing was co-led by Kurma Partners, WE Life Sciences and the French Tech Seed fund managed on behalf of the French government by Bpifrance as part of France 2030, with participation from Argobio, Angelini Ventures, Carma Fund, Capital Grand Est and Sambrinvest.

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DELPHINE CHARVIN, ELKEDONIA

ELK1 is highly expressed in the hippocampus and nucleus accumbens, brain regions that form a critical circuit linking memory, context and reward.

The molecule works by modulating genes involved in neuroplasticity and turning off genes involved in inflammation. “We know now that at least in some sorts of depression, inflammation is a key factor. And thanks to the effect on neuroplasticity, it will alleviate the chronicity of depression,” said Charvin. “That’s the ultimate goal for us: to make depression an acute condition and not a chronic one anymore.”

Charvin said the company has seen rapid effects in animal models after a single administration, similar to the fast onset of ketamine. But ketamine has psychedelic effects and must be administered in a clinic, which will not be required for Elkedonia’s drug.

“And ketamine may be addictive in patients, which is not the case for ELK1 inhibition. In fact, the reverse has been shown in animal models of addiction: inhibiting ELK1 can also reverse the addictive effect of cocaine, for example,” said Charvin.

The plan is to raise a series A after identifying a lead compound and showing efficacy in relevant translational animal models of depression, of which there are two, according to Charvin.

The company, which is headquartered in Strasbourg, is also establishing a blood-based biomarker to be used in clinical trials. Charvin said the company doesn’t know yet if the marker will be ELK1 itself or another indicator of the signaling pathway, but the goal is to use it to select patients, prove target

COMPANY PROFILE

Elkedonia S.A.S.

Strasbourg, France

Technology: Non-synaptic neuroplastogen with a non-hallucinogenic, non-addictive mode of action

Origin of technology: Argobio Studio and CNRS, INSERM, Sorbonne University

Disease focus: Neurology

Clinical status: Preclinical

Founded: 2025 by Delphine Charvin, Jocelyne Caboche, Mélanie Rouillier, Argobio Studio and Melkin Pharma

Academic collaborators: Sorbonne University

Corporate partners: None

Number of employees: Six

Funds raised: €11.25 million (\$12.85 million)

Investors: Kurma Partners, WE Life Sciences, Bpifrance (the French Tech Seed fund), Argobio, Angelini Ventures, Carma Fund, Capital Grand Est and Sambrinvest

CEO: Delphine Charvin

Issued Patents: Undisclosed

engagement, identify the optimal dose, and get a quantifiable objective measure of treatment efficacy.

According to BioCentury’s BCIQ database, no other companies are pursuing ELK1.

Caboche founded her first company, Melkin Pharmaceuticals S.A.S., in 2015 to study ERK signaling in different contexts, mainly focused on cancer.

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