



Universidad
Andrés Bello



Astrodepressants

Antidepressants Targeting Astrocytes

Dr. Jimmy Stehberg

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PROBLEMS WITH CURRENT ANTIDEPRESSANTS



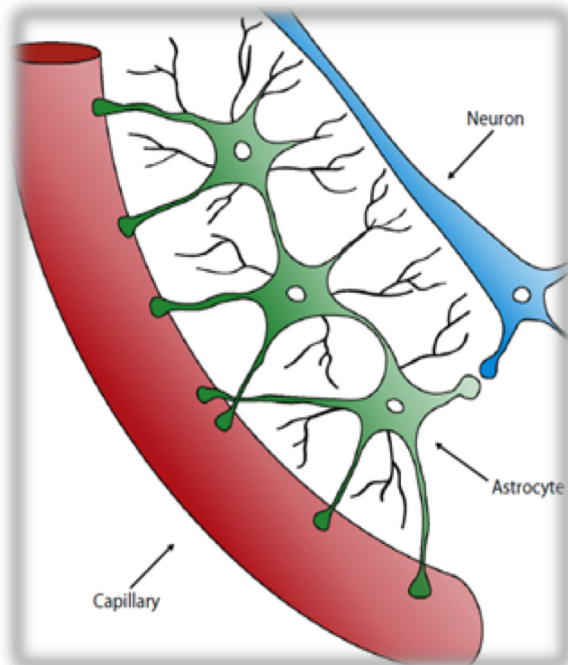
- 50% of people with depression do not respond to current antidepressants.
- Current antidepressants take 3 weeks to exert their effects, requiring the prescription of other drugs.
- All drugs in the market target neurons, most of them off patent, but there are no drugs targeting other brain cells.
- The newest drug, ketamine, has fast antidepressant effects, but many side effects

ASTROCYTES ARE A NOVEL TARGET FOR ANTIDEPRESSANTS



- Novel target within astrocytes.
- Small molecule lead compound.
- Fast-acting-effects within 10 minutes.
- No measurable side effects.

CHANGING NEUROTRANSMITTER SIGNALS TO NEURONS



- Astrocytes release transmitters into synapses.
- These transmitters activate neurons.
- Decreased release from astrocytes results in reduced neuron-to-neuron synaptic activity.



Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Journal of Physiology - Paris

journal homepage: www.elsevier.com/locate/jphysparis

Review Paper

Role of astrocytes in memory and psychiatric disorders

Moraga-Amaral^a, J.M. Izquierdo-Durán^a, E. Simón^b, J. Sotomayor^a



MARKET DATA

“A \$14 Billion Market”.

- The US accounts for 40% of the antidepressant market.
- 20 Million suffer from severe depression.
- Market continues to grow, especially with the aging population, reaching 17% in people over 65 years.





COMPETITION

DRUG	TIME TO ATTAIN EFFECTS	NOVELTY OF TARGET	SIDE EFFECTS
Serotonin transporter (SSRIs)	3-4 weeks	Not novel	Low
Cyclic antidepressants	3-4 weeks	Not novel	High
Monoamine oxidase inhibitors (MAOIs)	3-4 weeks	Not novel	High
Serotonin and norepinephrine reuptake inhibitors (SNRIs)	3-4 weeks	Not novel	Moderate
Ketamine	10 minutes	Not novel	High
Aleph Pharma product	10 minutes	Novel	Low

TRACTION

- Funding: \$700K in non-dilutive grants.
- We have published 7 papers on the role of our target in psychiatric disorders, including depression, anxiety and memory.
- We have setup active collaborations on this topic with several labs in Chile, Belgium, Germany and France.



*US patent granted on a small molecule for use in depression: US 14/404.358 "Use of compounds that selectively modulate astrocytic release of substances..."

AN INTERNATIONAL SCIENTIFIC & BUSINESS TEAM



Investigators:

- Dr. Jimmy Stehberg CEO and *in vivo* models.
- Dr. Felipe Simon (*in vitro* screening).
- Dr. Danilo González (*In silico* work; small molecules).



Outside collaborators:

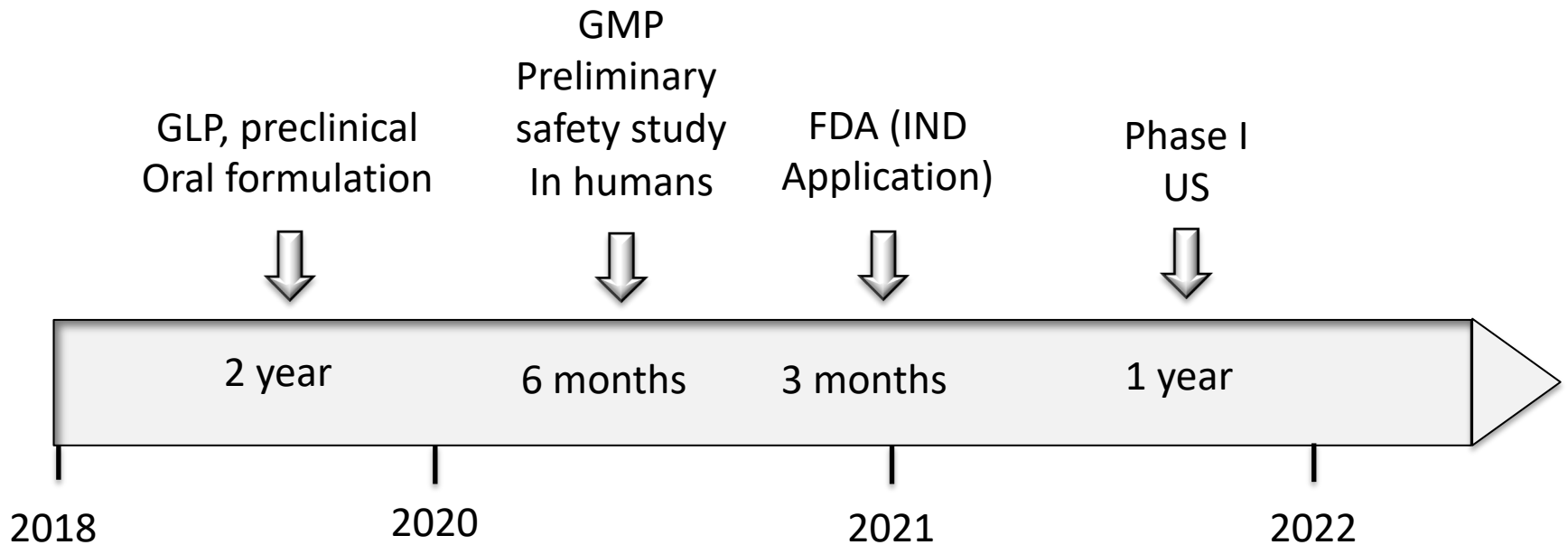
- Fraunhofer IME, Germany.
- UGhent, Belgium (Luc Leybaert).
- KULeuven, Belgium (Geert Butynck).
- UDD, Chile, (Mauricio Retamal).



Advisors:

- Nancy Levy.
- Francisco Chiang.

TIMELINE





BOSTON



- Partnerships for development.
- Collaborations for further studies.
- Funding.

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