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ReSynapse Therapeutics

Novel Multi-Target Therapeutics for Treatment-Resistant Depression

Unmet Need

Treatment-resistant depression (TRD) affects 15M people (US, EU, Japan), 20-30% of depression patients who fail standard treatments. Current options achieve only 16.7% remission rates with 4-6 week onset and severe side effects (sexual dysfunction, weight gain, emotional blunting). Esketamine, the only novel mechanism approved in recent years, requires clinic visits. Psychedelics face regulatory barriers post-Lykos rejection (Aug 2024). The $1.9B TRD market is underserved, with premium pricing validated and minimal competition, drives urgent demand for differentiated mechanisms.

Our Solution

ReSynapse develops **novel multi-target serotonin modulators for treatment-resistant depression by identifying an optimized 4-receptor combination.** We integrate our understanding of serotonin receptor structure & function, approved and failed drug mechanisms, preclinical data, and receptor pharmacology **to identify which serotonin receptors drive therapeutic benefit (include) versus adverse effects (exclude)**. Target profile: faster onset (1-2 vs 4-6 weeks), improved efficacy in treatment-resistant cases, and reduced side effects through precise exclusion of liability pathways.

Innovation & Differentiation

Disease-specific receptor profiling: **Our core innovation** is integrating multiple evidence layers (clinical outcomes, approved drugs, preclinical data, receptor pharmacology) to derive optimized receptor combinations for each indication. This mechanistic understanding-driven approach reduces target risk by validating biology before molecule design. **Core capability: Computational multi-target drug design**: We employ specialized computational methods to design single molecules that precisely hit identified multi-receptor profiles with defined pharmacology. This specialized pharmaceutical computational chemistry expertise is unavailable in traditional medicinal chemistry and general AI platforms (not rational design). **Differentiation:** Biology-validated targets + rational multi-target design = distinct from single-target SSRIs, crude polypharmacology, hallucinogenic psychedelics, and AI screening approaches.

Regulatory & Market Opportunity

FDA-approved multi-target CNS precedents (vortioxetine, brexpiprazole) establish a regulatory pathway. Recent deals validate space: AbbVie/Gilgamesh $2B partnership, Boehringer/Kinoxis $273M preclinical deal. **TRD:** $1.9B market with premium pricing validated by esketamine ($6-10K/month). TRD patients have already failed generics. **Pipeline expansion: PTSD** ($3.4B market, only 2 approved drugs, post-Lykos opportunity) and anxiety disorders ($5.8B market). Exit path: Partnership/acquisition or earlier licensing.

Status & Milestones

Status: Virtual screening complete; lead compounds identified; advancing towards experimental validation. **Pre-Seed:** POC validation + IP filing (NCE); **Seed phase**: In vivo efficacy, lead optimization and candidate selection → preclinical development. **Series A**: IND-enabling studies +Ph1.

Team

Dr. Dorit Cohen Carmon, CEO: Serial biotech entrepreneur, 10+ years CNS drug development, Ex-CEO in previous ventures. **Dr. Itai Bloch, CTO:** 15+ years pharmaceutical computational chemistry with specialized expertise in rational multi-target drug design. **Prof. Alexandre Varnek, Advisor:** 2024 Herman Skolnik Award winner, world leader in chemoinformatics, 400+ publications. **Prof. Joseph Zohar**, **Advisor:** Psychiatrist, global expert in TRD, and PTSD.

Pre-Seed Funding Milestones

Milestones: (1) Synthesis, (2) Multi-receptor in-vitro validation, (3) Functional in-vivo POC, (4) Off-target screening, (5) IP filing (NCE), (6) Computational expansion → Seed-ready. **Use of funds:** 55% R&D, 30% Team & Operations, 10% Computational tools, 5% IP & BD.

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