Project Tolera

Antigen-specific tolerance, one patient at a time.

A citizen-scientist's roadmap for a personalized pMHC-II tolerance vaccine in eosinophilic esophagitis — from AI/ML design to first-in-patient. One course, not a lifetime of symptom suppression.

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The problem

Eosinophilic esophagitis (EoE) is a chronic, food-driven immune disease — **~167,500 people in the US** and rising. It is fundamentally **antigen-specific**: a food peptide, presented on an MHC-II molecule, to a pathogenic T-cell clone. Yet **every approved and pipeline therapy** (dupilumab, cendakimab, budesonide, PPIs) is a broad, chronically-dosed symptom suppressor. None is antigen-specific; none induces durable tolerance. Patients face a lifetime of injections, steroids, or restrictive diets.

The solution

From one biopsy + blood draw, the workflow identifies the patient's HLA type and causal food-reactive clone and manufactures an N-of-1 vaccine that **re-educates only that clone** — Signal-1 anergy + multivalent nanoparticle Tr1/IL-10 induction. The individualized-neoantigen-vaccine model of oncology, applied to food antigens: **one course, not lifelong dosing.**

Platform — PACT™

A shared, GPU-validated MHC-II backbone with a **swappable peptide cassette** — only the peptide changes per patient, so N-of-1 manufacturing is tractable (vein-to-vaccine target 6–10 weeks). The same engine extends to celiac and other food/auto-antigen disease.

Validation

A 9-construct dairy/wheat/soy panel folds at **ipTM 0.87–0.90, 15/15 peptides in-groove**. The dairy anchor (β-casein aa59–78, HLA-DRB1*07:01) is supported by a reported tetramer-validated epitope.* Wheat/soy are computational priors; wet-lab validation is a near-term milestone.

Market & differentiation

~$2.2B/yr US TAM (biologic-eligible). Base-case ~$1.0B mature revenue at a ~$150k one-course price — **~23% below** Tzield's actual $194k/course. Project Tolera is the **only antigen-specific, one-course** entrant; every competitor is broad-mechanism and chronic. A companion diagnostic adds an earlier, independent revenue line.

Why now & the comp

Tzield (2022) proved the FDA will approve a disease-modifying immune therapy; neoantigen vaccines proved per-patient biologics clear CMC. Tzield — a first-in-class tolerance asset — drew a **$2.9B Sanofi acquisition** on a single indication.

What it would take — roughly **$8M** would carry the concept from validated in-silico design through human functional validation, murine PoC, GLP tox, GMP/IND lots, the companion diagnostic, and regulatory filings to a **cleared IND and first-in-human dosing**, the single largest de-risking step available today. A further ~$35M would reach the Phase 2 durable-remission proof-of-concept. **If this roadmap is useful to you — as a researcher, clinician, advocate, or funder — reach out.**

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