The team so far

- Stanford University
- **Tsachy Weissman** (Lead investigator, Electrical Engineering)
- **Hanlee Ji** (Medicine (Oncology))
- **Mary Wootters** (Computer Science & Electrical Engineering)

- **Peter Griffin** (Senior research engineer, Electrical Engineering)
- **Billy Lau** (Postdoc, Biochemistry and Engineering)
- **Dmitri Pavlichin** (Postdoc, Applied Physics and Electrical Engineering)

Research areas

- Chemical synthesis of DNA oligonucleotides, barcoding methods for PCR, targeted sequencing (Hanlee Ji)

- Error-correcting codes, signal processing (Mary Wootters)

- Denoising and data compression (Tsachy Weissman)

Unique qualifications and capabilities

- **Experimental and theoretical**: DNA oligo assembly and addressing methods (Hanlee Ji and Billy Lau), denoising and error correcting coding (Tsachy Weissman and Mary Wootters)

- **Writing of long oligos** (> 200 base pairs) is presently difficult and expensive: we aim to develop techniques to assemble long oligos systematically from short ones, requiring both the biochemistry expertise of Hanlee Ji's group, and the coding theory and denoising expertise of Mary Wootters and Tsachy Weissman.

- **Re-readability** in molecular storage information is difficult, but desirable: Hanlee Ji's expertise enables exploration of different storage chemistries (e.g. oligos organized systematically on a surface) and non-destructive information retrieval protocols.

- Ability to design and experimentally test **novel capabilities** for a molecular information storage-based operating system: the chemistry of DNA enables approximate similarity search in a dataset using partially matching "query" oligos (Unix "grep" with approximate string matching).

Capabilities we are seeking

- Long-read sequencing, writing, and bioinformatics expertise (for example with the Oxford Nanopore Technologies sequencers).

Contact information

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