Docket #: S25-527

A Novel Immunodiagnostic System for the Diagnosis of Dormant Infection

Stanford scientists have developed a nine-analyte synovial fluid proteomic panel (led by PDGF-B and CXCL11) that detects clinically silent, "dormant" infections in patients undergoing revision joint replacement surgery, identifying those at high risk of infection relapse before it occurs.

Patients who have previously had an infected joint replacement face a critical and underappreciated clinical problem: current standard criteria for clearing them as "infection-free" prior to re-implantation surgery are unreliable. Many patients declared infection-free still harbor a biologically active but clinically silent dormant infection that conventional tests simply cannot detect, placing them at significant risk for recurrence after surgery. Researchers at Stanford performed synovial fluid proteomics to demonstrate that patients cleared for re-implantation often display an inflammatory signature nearly identical to those with active infections, despite normal standard lab values. From this, a nine-analyte synovial fluid proteomic panel was identified, led by PDGF-B and CXCL11, that distinguishes these hidden dormant infections from truly uninfected joints that carry a much lower risk of recurrence. Over a mean of three years, 2 of 9 biomarker-positive joints developed culture-confirmed recurrence (22%), while 0 of 14 biomarker-negative joints relapsed (0%), so the panel functions as a high-specificity rule-out test that clears a joint as truly infection-free before re-implantation. This technology offers surgeons a powerful new tool to identify which patients remain at risk before re-implantation, enabling more informed treatment decisions and reducing the costly and debilitating cycle of repeat infections that affects thousands of joint replacement patients each year.

Stage of Development

Prototype: the nine-analyte panel is currently measured by the Olink proximity extension assay (PEA), with development underway toward a targeted ELISA for the lead markers PDGF-B and CXCL11.

Applications

- Diagnosis of dormant infection
- Prognostic of future infection risk

Advantages

- Able to detect dormant infection and rule out truly uninfected joints before re-implantation

Publications

- Manasherob, R., Warren, S. I., Flanagan, C. M., Arora, P., Heo, L., Moore, C. J., Chow, S. K. H., Otieno-Ayayo, Z. N., Furukawa, D., Maloney, W. J., Lowenberg, D. W., Goodman, S. B., & Amanatullah, D. F. **(2025)**. The presence of persistent synovial inflammation after "Eradication" unmasks the "Unseen" dormant state of infection allowing the prediction of infection free survival in total joint replacements. *Journal of translational medicine*, 23(1), 1392.

Innovators

- Derek Amanatullah

Licensing Contact

Seth Rodgers

Licensing Manager, Life Sciences

Email