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Fluorescence and UV-vis Spectroscopy of Synovial Fluids MARIE J. PINTI, John Carroll University, NENAD STOJILOVIC, University of Wisconsin Oshkosh, MARK W. KOVACIK, Summa Health System, Akron — Total joint arthroplasty involves replacing the worn cartilaginous surfaces of the joint with man-made materials that are designed to be biocompatible and to withstand mechanical stresses. Commonly these bearing materials consist of metallic alloys (TiAlV or CoCrMo) and UHMWPE. Following joint arthroplasty, the normal generation of micro-metallic wear debris particles that dislodge from the prosthesis has been shown to cause inflammatory aseptic osteolysis (bone loss) that ultimately results in the failure of the implant. Here we report our results on the novel use of Fluorescence and UV-vis spectroscopy to investigate the metallic content of synovial fluid specimens taken from postoperative total knee arthroplasties. Preliminary finding showed presence of alumina and chromium is some specimens. The ability to detect and monitor the wear rate of these implants could have far reaching implications in the prevention of metallic wear-debris induced osteolysis and impending implant failure.

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