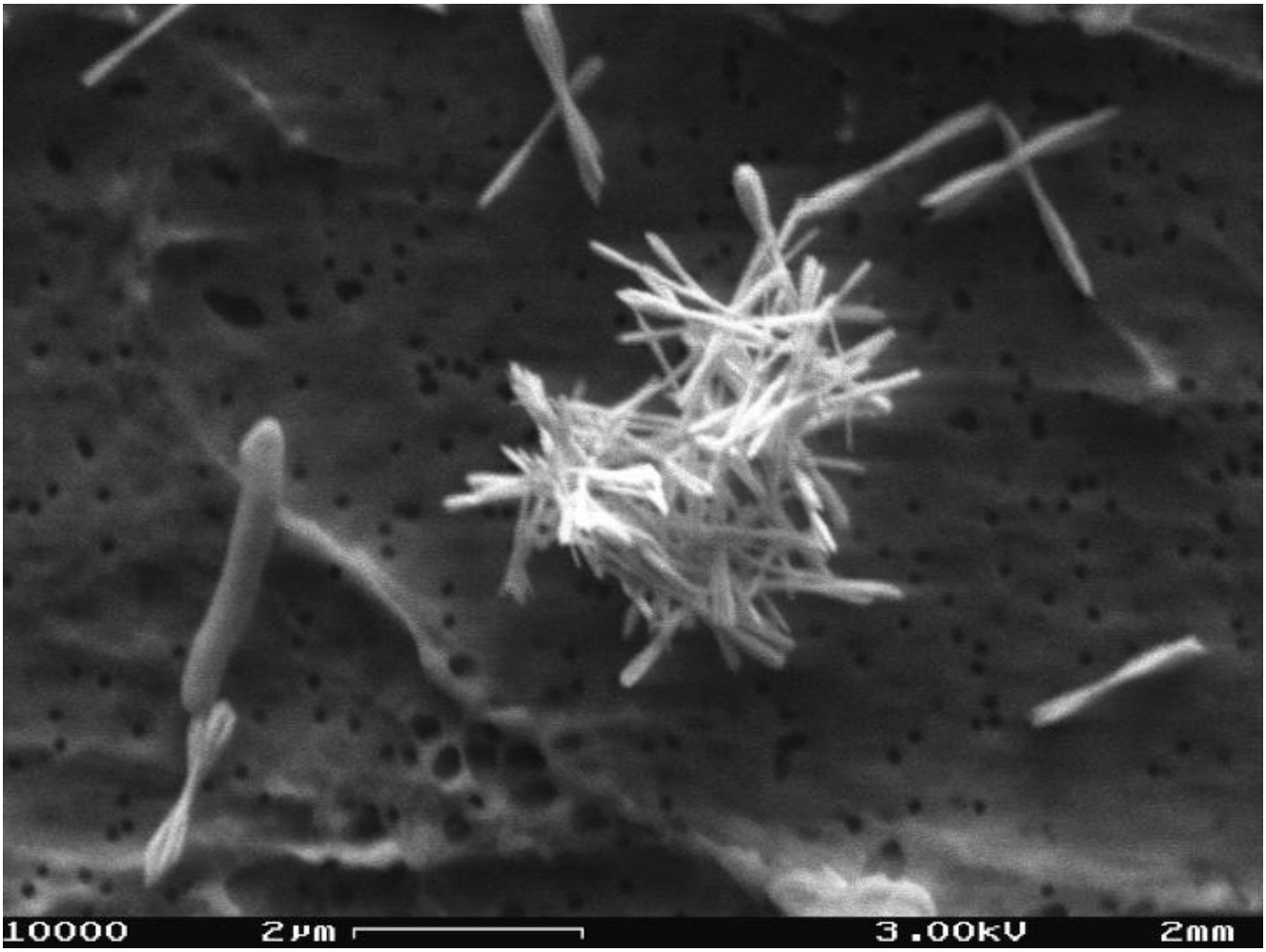
Biomaterial from Bacteria Shows Promise for Range of Photonic Applications

Nonlinear optical measurements of the material showed strong saturable absorption and nonlinear optical extinctions induced by Mie scattering over broad temporal and wavelength ranges. Through comparative studies in thermal-optic switching, the researchers demonstrated that the biomaterial tellurium (Bio-Te) provided definite improvements in the thermal-optic decaying lifetime compared to the materials WS_2 and graphene. Professor Werner J. Blau of Trinity College Dublin said that the biologically generated tellurium nanorods could be especially suitable for photonic device applications in the mid-infrared range. “This wavelength region is becoming a hot technological topic as it is useful for biomedical, environmental, and security-related sensing, as well as laser processing and for opening up new windows for fiber optical and free-space communications,” he said. While most optical materials are chemically synthesized, using a biologically based nanomaterial proved less expensive and less toxic, the team said. The team will continue to expand the biomaterial’s potential for use in all-optical telecom switches, and believes the material could be useful for expanding broadband capacity. “We need greater bandwidth and switching speeds,” University of Houston professor Seamus Curran said. “We need all-optical switches to do that.”



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