At a workshop held at the National Institute of Standards and Technology (NIST) in July 2000, the reference materials most needed for tissue engineering were identified as being three-dimensional reference tissue scaffolds of known porosity, interconnectivity, surface and bulk chemistry, physical and mechanical properties, and cellular reactivity. In response to this workshop, NIST has been pursuing collaborations to accomplish this objective. An ASTM task force was initiated at the November 19, 2003, meeting (Tampa, Fla.) of Committee F04.42 – Biomaterials and Biomolecules, for the development of reference scaffolds for TEMPs. The task force will conduct measurements for characterization of test scaffolds that will be supplied to its members. The development will focus on scaffolds that will consist of a regular array of cubic pores with consistent interconnections. It was decided that two test scaffolds should be characterized, having either 300 µm or 600 µm pore-edge dimensions.

Results from the characterization effort will be used by NIST in the development of reference scaffolds for distribution to researchers and developers of scaffolds for tissue engineering applications. The characterizations of the test specimens will be used to help ensure that the features needed in the reference scaffolds will be well-defined and that their measurements will produce consistent results for terms such as porosity, interconnectivity and tortuosity, and possibly others (these terms are found in a draft characterization guide that is under development in a related effort headed by Dr. Paul Tomlins of the National Physical Laboratory). The task force is headed by Dr. John Tesk (NIST), and Drs. Michael Yaszemski and Esmaiel Jabbari (Mayo Clinic). The target schedule is to have measurements of test scaffolds completed in time for the April 2004 meeting of the ASTM, all issues resolved by August 2004, and the start of fabrication of the reference scaffolds by the end of August 2004, after which scaffolds with spherical geometry will be considered for the next development. The task force planned to begin the evaluation of test scaffolds in January 2004. Enquiries as to participation should be made as soon as possible to facilitate planning and coordination of the effort. To join the task force or request further information, contact John Tesk at 301-975-6799 or john.tesk@nist.gov; or Liisa Kuhn (chair of Committee F04.42) at 860-679-3922 or lkuhn@uchc.edu.