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### **Pre-Medical Education in the Physical Sciences for Tomorrow's Physicians**

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Medical knowledge is being transformed by instrumentation advances and by research results including genomic and population level studies; at the same time, though, the premedical curriculum is constrained by a relatively unchanging overall content in the MCAT examination, which inhibits innovation on undergraduate science education. A committee convened jointly by the Association of American Medical Colleges and the Howard Hughes Medical Institute has examined the science and mathematics competencies that the graduating physician will need, and has asked which of these should be achieved during undergraduate study. The recommendations emphasize competency – what the learner should be able to “do” at the end of the learning experience – rather than dictating specific courses. Because the scientific content of modern medical practice is evolving, new science competencies are desirable for the entering medical student. An example is statistics, an increasingly prominent foundation for database and genomic analysis but which is not yet uniformly recommended as preparation for medical school. On the other hand, the committee believes that the value of a broad liberal arts education is enduring, and science coursework should not totally consume a premedical student's time. Thus if we recommend new areas of science and mathematics competency for pre-meds, we must find other areas that can be trimmed or combined. Indeed, at present there are some science topics mandated for premedical study, which may not be essential. For these reasons, the committee aims to state premedical recommendations in ways that can be met either through traditional disciplinary courses, or through innovative and/or interdisciplinary courses. Finally, we acknowledge that practice of medicine requires grounding in scientific principles and knowledge and in the practice of critical inquiry. These principles may be learned and practiced in undergraduate study through work in the physical sciences, as well as in biology, and such multidisciplinary training should be encouraged.