

Background on Pre-Medical Changes

In 2009, the Scientific Foundations for Future Physicians Report (SFFP) recommended that medical education be centered around competencies, not courses. “The SFFP Committee, was charged to: consider the means and consequences of establishing the concept of “science competency” (learner performance), rather than academic courses, as the basis for assessing the preparation of medical school applicants and the proficiency of medical school graduates.”

- Some medical schools and undergraduate institutions are exploring competency-based education, although it will take time to implement many of the changes. The Association of American Medical Colleges (AAMC) Committee on Admissions is recommending that medical schools assess their current prerequisites with a focus on creating the least restrictive pathways for applicants.
- Parallel to this effort has been the commitment to reform the Medical College Admissions Test (MCAT) to better reflect the recommendations for competency-based education. The Association of American Medical Colleges (AAMC) is implementing a new MCAT exam in 2015. The new exam will require students to draw on their scientific knowledge, but also to more fully apply their scientific inquiry and reasoning skills.
- Since most students take the MCAT in their junior year, changes to the MCAT in 2015 will affect first-year students who entered the University in the fall of 2012 and after.
- The new MCAT will include a new section, “**Psychological, Social and Biological Foundations of Behavior**”, which will include material from psychology (60% of the exam) and sociology (30%) that is not included in the current exam. The remaining 10% will include behavioral foundation topics from biology. Although MCAT does not require coursework, it is likely that most students will want to take an introductory course in **psychology** to be well-prepared for this new section of the exam. Student may also want to take an introductory course in **sociology** (although students may also be able to prepare for this through self-study or formal exam test prep). The current MCAT writing exam is being eliminated, which will make room for this new MCAT section.
- MCAT 2015 will include newly configured material in the two natural science sections: (Biological and Biochemical Foundations of Living Systems and Chemical and Physical Foundations of Living Systems). In order to be well prepared for these sections, students will now need specific preparation in **biochemistry**, in addition to the biology, inorganic and organic chemistry and physics required of the current exam.

(over)

- The exam “**Critical Analysis and Reasoning Skills**” will replace the **Verbal Reasoning Exam**. While specific knowledge of disciplines is not required, the exam content will be drawn from the social sciences and humanities, including the areas of ethics and philosophy, cross-cultural studies, and population health, among other areas. While there is no specific recommended coursework, sound preparation in the social science and humanities General Education courses should be helpful for students preparing for this particular portion of MCAT 2015.
- The University of Iowa Carver College of Medicine has modified its pre-medical prerequisites to add a **biochemistry** course, as a result of changes to its medical school curriculum. This applies to students applying for 2014. The course may be applied to the current advanced biology requirement, or as part of the chemistry prerequisite. The College is not changing its other prerequisites at this time.
- A curriculum committee consisting of key faculty from the psychology, sociology, science and mathematics departments, as well as representatives from the Carver College of Medicine and Academic Advising Center was formed in summer 2012 to address MCAT 2015 and related issues. Currently, the committee is completing a detailed mapping of our courses related to the key areas covered by the MCAT to determine the best fit, using the mapping tool provided by the Association of American Medical Colleges.

Resources:

Scientific Foundations of Future Physicians Report: http://www.hhmi.org/grants/pdf/O8-209_AAMC-HHMI_report.pdf

Association of American Medical Colleges Initiatives:
<https://www.aamc.org/initiatives/admissions/>

PeerReview articles on the New MCAT and Curricular Change:
<http://www.aacu.org/peerreview/pr-fa12/index.cfm>

Consequences of MCAT changes for undergraduate curricular revisions

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- 1) Inquiry based, active learning with an emphasis on extracting and integrating knowledge will drive curricular reforms in the undergraduate and graduate curriculum.
- 2) Inquiry based learning requires training the mind to extract information from existing data and apply this to solve a question or a problem.
- 3) This requires inquiry based lectures which are enhanced by laboratory experience to learn how to extract information from experiments.
- 4) Inquiry based, active learning will prepare undergraduate students not only for MCAT testing but also for the case based learning at the medical school and the future medical practice.
- 5) Inquiry based, active learning will develop habits of inquiry and innovation in future MD students and ready them for life time learning to continuously expand their understanding of diseases.
- 6) Beyond inquiry based, active learning approaches, the future undergraduate curriculum must generate a basic understanding of the impact of genetic revolution on medical practice.
- 7) Treatments will eventually be based on a more sophisticated understanding of the genetic basis of predispositions to develop certain diseases and will result in personalized medical treatment.
- 8) Undergraduate education should ready students to think about health as the interplay between genetic predisposition and the environment.
- 9) Biology aims to develop a new track, Biology of Disease, to provide the biological framework for an in depth understanding of disease as a personal deviation from a well-adjusted interaction with the environment.

MCAT Question Structure

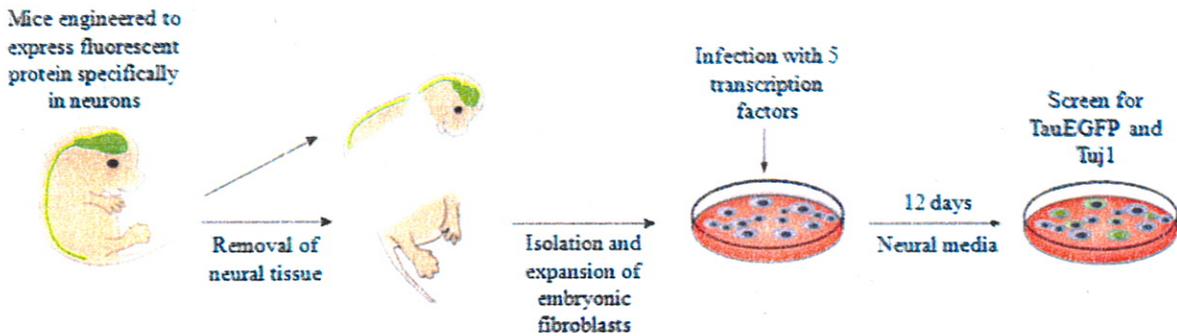


Figure 1. Experimental protocol for infecting embryonic fibroblasts from engineered TauEGFP mice

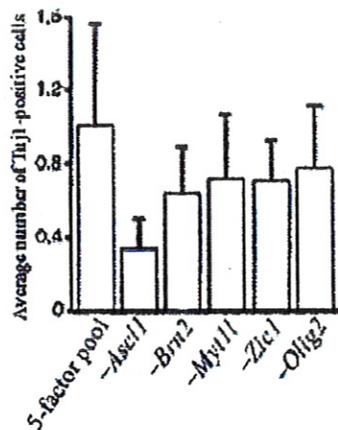


Figure 2. Average number of Tuj1-positive cells visible in a 20x field normalized to the 5-factor pool condition (- indicates omission of the specified gene; error bars = standard deviation)

Source: Adapted from: a paper by T. Vierbuchen, A. Ostermeier, Z. Pang, Y. Kokubu, T. Sudhof, and M. Wenig, ©2010 Macmillan Publishers, Ltd.

[One of a set of five questions associated with this experiment]

3) Of the five candidate genes, which produces a factor that most markedly increases the efficiency with which fibroblasts commit to a neuronal lineage in vitro?

- A. *Ascl1*
- B. *Brn2*
- C. *Zic1*
- D. *Olig2*

	July	August	September	October	November	December	January	February	March	April	May	June
Year 1			Foundations Block Clinical and Professional Skills Medicine and Society	Clinical and Professional Skills Medicine and Society MOHD 1 Anatomy		Vacation		Clinical and Professional Skills Medicine and Society MOHD 2				Summer Programs
Year 2	Summer Programs		Clinical and Professional Skills Medicine and Society MOHD 4	Clinical and Professional Skills Medicine and Society MOHD Keystone		Vacation	1 wk Clinical Beginnings					Core Clinical Clerkships Ambulatory Care Block (Family Medicine, Outpatient Internal Medicine, Community Based Practice) Internal Medicine, Neurology, OB/GYN, Pediatrics, Psychiatry, Surgery
Year 3		Core Clinical Clerkships Ambulatory Care Block (Family Medicine, Outpatient Internal Medicine, Community Based Practice) Internal Medicine, Neurology, OB/GYN, Pediatrics, Psychiatry, Surgery		4 wk USMLE Block		Vacation						Pathways (recommended selectives; electives) "Majors": Undifferentiated, Generalist, Interventionalist
Year 4			USMLE 2 CK and CS Dean's letter	Pathways (recommended selectives; electives) "Majors": Undifferentiated, Generalist, Interventionalist		Vacation			Match			Graduation