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Biology Readiness Survey 2018

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Biology Readiness Surveys: Establishing the Content Domain and Test Specifications for the Biology Section of the Dental Admission Test (2018)

Background

In 2017, at the direction of the American Dental Association's (ADA's) Council on Dental Education and Licensure (CDEL), the ADA's Department of Testing Services (DTS) initiated activities to update and establish the content domain and test specifications for the biology section of the Dental Admission Test (DAT). This effort relied heavily on the expertise of biology subject matter experts serving on the DAT Biology Test Construction Team (TCT), working closely with DTS staff to specify relevant content areas for possible inclusion in the biology test section. Three surveys were conducted to inform the biology section updates. Survey data collection was open from October 9, 2018 to November 26, 2018. Findings were reviewed and interpreted by the Biology TCT, DTS staff, and CDEL's Dental Admission Testing Committee (DATC), with final review and approval of proposed changes by CDEL occurring in June of 2019. Revisions to the DAT are expected to be implemented in 2022. This document summarizes information concerning the implementation of the surveys and the overall findings of this effort.

Approach

Three ***Biology Readiness*** surveys were developed to identify core knowledge in biology that first-year U.S. dental students must know when entering dental school, in order to be adequately prepared to benefit from further training. "Core knowledge" refers to required knowledge that establishes readiness for dental school training. Incoming dental students who possess the knowledge prerequisites are ready to face the challenges associated with their first year in dental school, while those who lack the required knowledge are unlikely to be successful unless they revisit and learn the fundamentals. Updates to the DAT biology section should therefore reflect current biology core knowledge requirements in order to effectively assess students' readiness for dental school training.

The surveys targeted three distinct populations: pre-health biology instructors, faculty who teach first-year dental students, and current dental students. It was reasoned that insights from each of these groups would allow the Biology TCT to compare information that dental schools require first-year dental students to know with information that pre-dental programs teach candidates. Survey results could then be used to identify areas of commonality and discrepancy between pre-dental instruction, dental school requirements, and the DAT biology content outline. Moreover, the surveys could begin the process of identifying specific pieces of core knowledge in each topic area within the DAT biology section, providing valuable information for item development purposes.

Survey of Pre-Health Biology Instructors

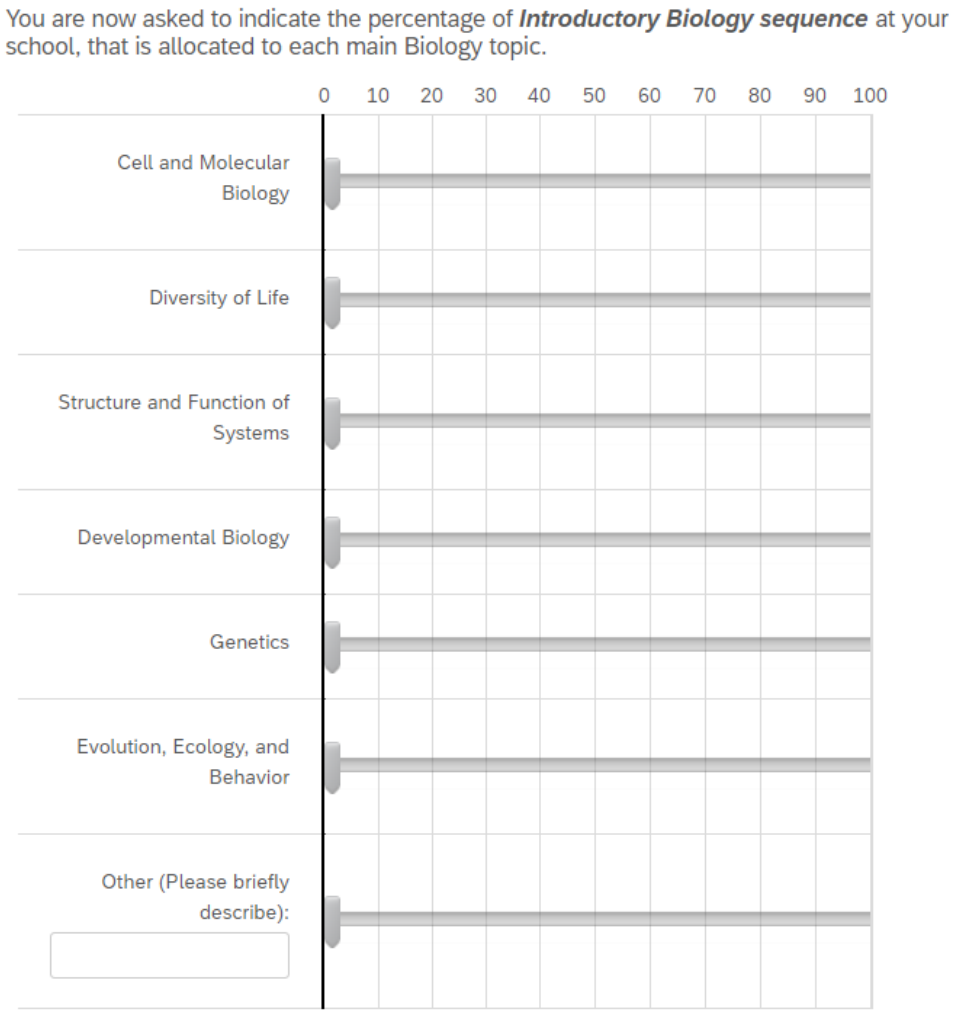
Recruitment & Sample

Survey invitations were distributed via email to biology pre-health faculty members. Email recipients were told that participation in the survey would help inform admission decisions and the development of examinations measuring knowledge of important topics and concepts in biology. The final sample consisted of 41 respondents from universities evenly distributed across the United States. A majority of respondents were professors, with an average of 15.2 years of experience as introductory/general biology instructors. All respondents worked at four-year universities, and most held a Ph.D. in biology.

Survey Items

Respondents were asked to indicate the percentage of course time allocated to various biology topics, first focusing on main biology topics, and then focusing on the subtopics associated with each main topic. As respondents indicated time allocations, the survey automatically totaled the percentages so that the total time allocation did not exceed 100%. Afterwards, respondents were given an opportunity to list any topics or subtopics they thought should be removed from or added to the biology section of the DAT, in open-ended responses.

Example:



Survey of Faculty who Teach First-Year Dental Students

Recruitment & Sample

Survey invitations were distributed via email to dental school deans, with the request that the survey be forwarded to first-year dental faculty who were well-acquainted with the depth and breadth of the first-year curriculum. Email recipients were told that participation in the survey would help inform the development of examinations that help dental schools identify candidates with the highest potential for success in dental school. The final sample consisted of 46 respondents from universities evenly distributed across the United States. A majority of respondents were dental school deans, with an average of 21.1 years of experience as dental school instructors. Most respondents held either D.M.D/D.D.S degrees or Ph.Ds.

Survey Items

Respondents were asked to rate the importance of various main topic and sub-topic areas covered in the biology section of the Dental Admission Test (DAT), using Likert response scales (1=*Not Important*; 5=*Extremely Important*). Afterwards, respondents were given an opportunity to list any topics or subtopics they thought should be removed or added to the biology section of the DAT, in open-ended responses.

Example:

The following **main** topics are covered on the Biology section of the Dental Admission Test (DAT).

How important is knowledge in each main topic area, for incoming students to be ready to meet the challenges of your dental school curriculum?

	Not Important	Somewhat Important	Moderately Important	Very Important	Extremely Important	Unable to Rate
Cell and Molecular Biology	○	○	○	○	○	○
Diversity of Life	○	○	○	○	○	○
Structure and Function of Systems	○	○	○	○	○	○
Developmental Biology	○	○	○	○	○	○
Genetics	○	○	○	○	○	○
Evolution, Ecology, and Behavior	○	○	○	○	○	○
Other (Please briefly describe):	○	○	○	○	○	○

Survey of Current Dental Students

Recruitment & Sample

Survey invitations were distributed via email to a random sample of dental students who had recently completed their second year in dental school, and who had completed the DAT and the NBDE Part I. Email recipients were told that participation in the survey would help identify knowledge that a first-year dental student must know when entering dental school in order to be adequately prepared to benefit from further training. The final sample consisted of 321 respondents. Demographic information was not collected.

Survey Items

Respondents were randomly assigned one subtopic within each of six main topic areas covered in the DAT. For each assigned subtopic, respondents were asked to provide an example of core knowledge that reflects the most detailed or complicated piece of information or concept that a student must know in that subtopic area, in order to be considered ready for training that could be provided anytime in the first year of dental school. Responses were open-ended.

Example:

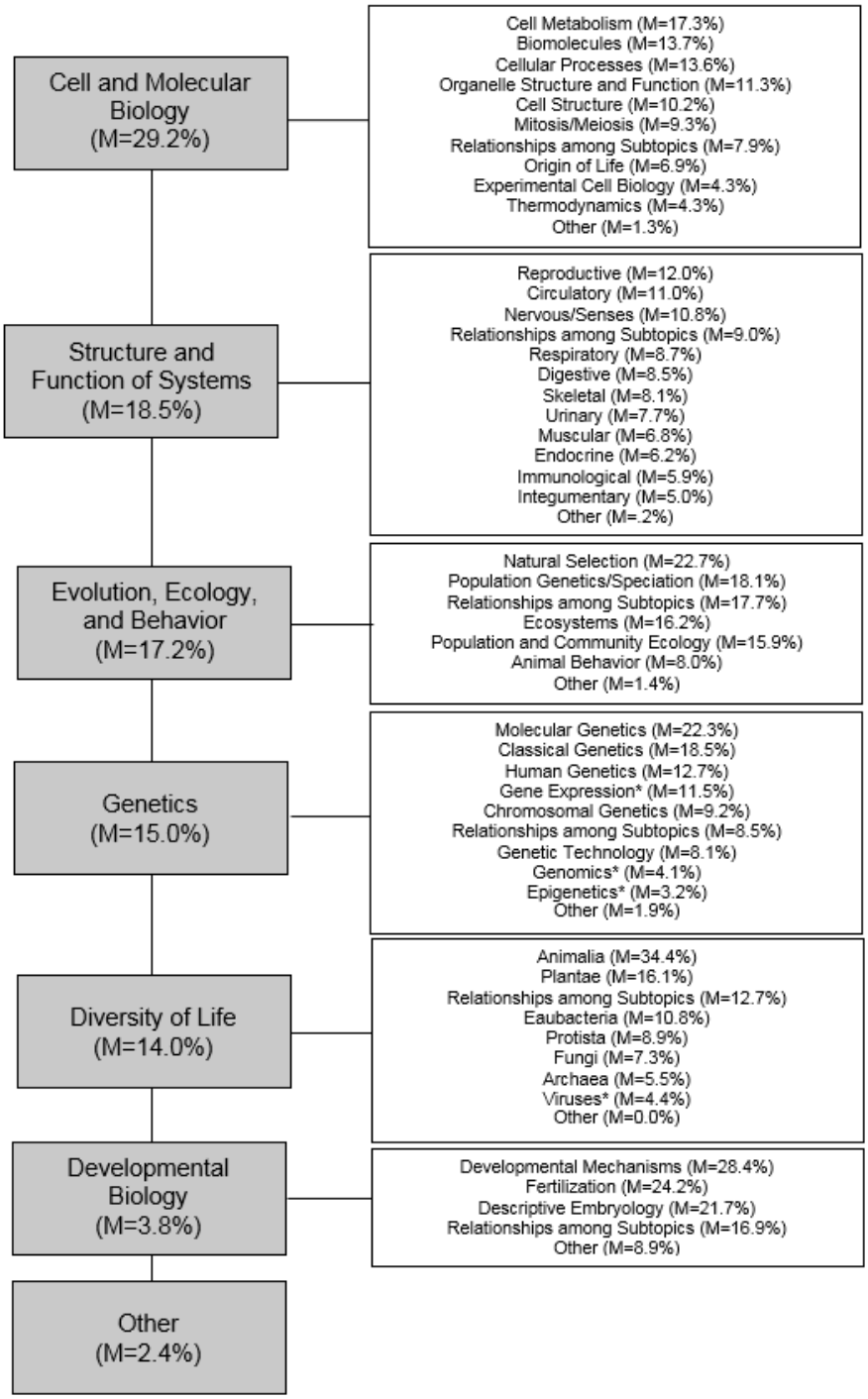
> Your **Cell and Molecular Biology** subtopic is **Mitosis/Meiosis.**
>
> Please provide an example of core knowledge that reflects the most detailed or complicated piece of information or concept that a student must know in **Mitosis/Meiosis**, in order to be considered ready for training that could be provided anytime in the first year of dental school.

Survey Results

Survey of Pre-Health Biology Instructors

Table 1 presents the mean percentage of time pre-health biology instructors allocate to each biology main topic and subtopic area. Topics are listed based on mean scores (descending order). If mean scores are equal, topics are listed alphabetically. Subtopics denoted by an asterisk (*) do not currently appear within the DAT, but are being considered for inclusion.

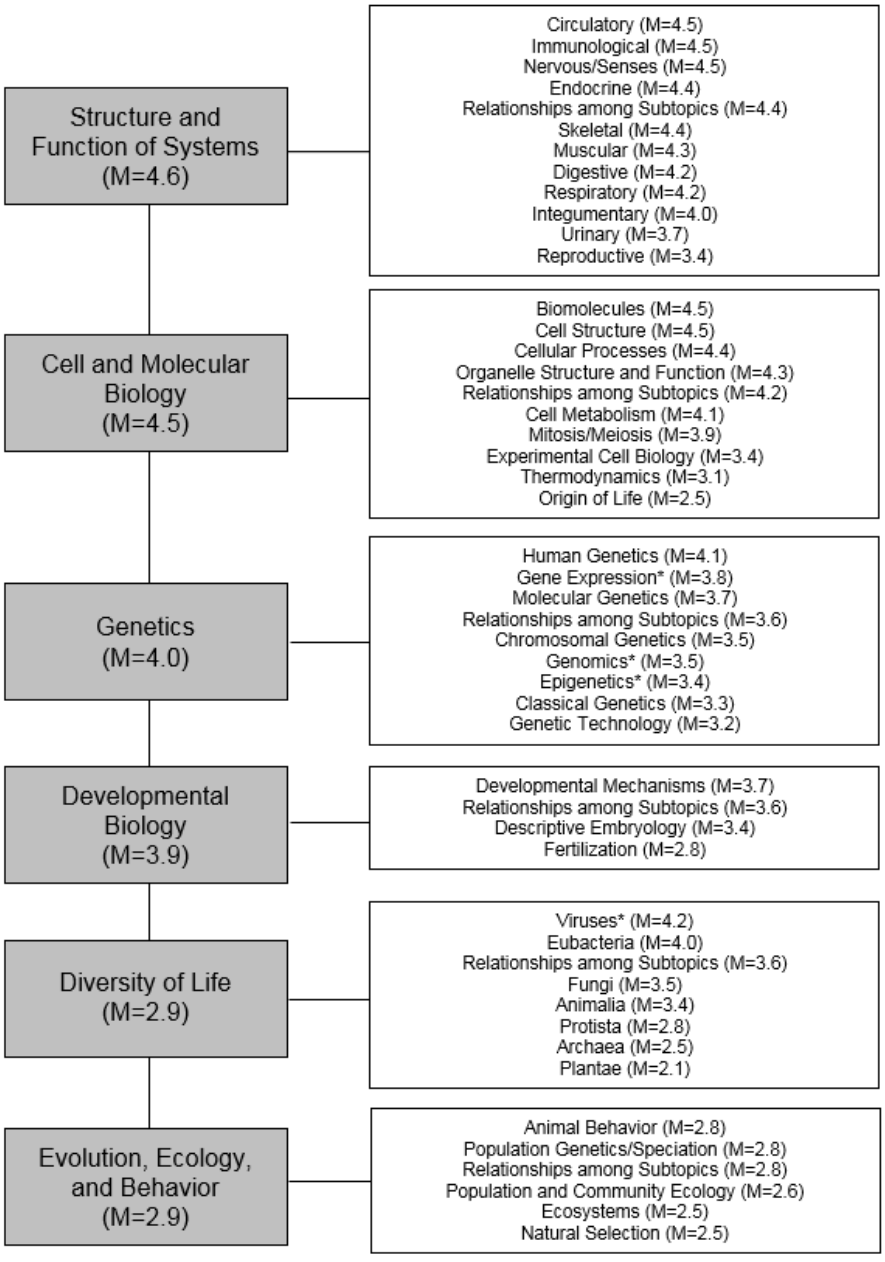
Table 1. Time Allocations (Survey of Pre-Health Biology Instructors)



Survey of Faculty who Teach First-Year Dental Students

Table 2 presents the mean importance ratings for each main topic and subtopic area, as indicated by faculty who teach first-year dental students. Topics are listed based on mean scores (descending order). If mean scores are equal, topics are listed alphabetically. Subtopics denoted by an asterisk (*) do not currently appear within the DAT, but are being considered for inclusion.

Table 2. Topic Importance Ratings (Survey of Faculty who Teach First-Year Dental Students)



Survey of Current Dental Students

The survey of current dental students was conducted to provide DAT Biology TCT members with information that could be used in writing DAT examination items. As such, the content is considered secure and extremely confidential. Due to the secure nature of this material, responses are not provided in the present summary.

Revisions to DAT Biology Test Specifications

Survey findings were reviewed and interpreted by the Biology TCT, DTS staff, and CDEL's Dental Admission Testing Committee (DATC). Based on the findings, changes to the biology test specifications of the DAT were recommended and approved. Changes to the biology test specifications will be shared with communities of interest prior to their implementation, which is expected to occur in 2022.