

BLOCK 2: THE HUMAN BLUEPRINT

CWRU SOM WR2 CURRICULUM

Review and Action Plan Class of 2020

Block Leader: Jonatha Gott, Ph.D.

Block Co-leader: Joseph Bokar, M.D./Ph.D.

Primary Content Areas: Cancer Biology, Cell Biology, Development (Embryology), Endocrinology, Genetics, Molecular Biology, Reproductive Biology

Longitudinal Content Areas: Histopathology, Anatomy, Bioethics

DESIGN TEAM MEMBERS:

- Joseph Bokar, M.D., Ph.D. (Block Co-leader, Cancer Biology)
- Ron Conlon, Ph.D. (Development)
- George Dubyak, Ph.D. (Cell Biology)
- Angelina Gangestad, M.D. (Reproductive Biology)
- Jonatha Gott, Ph.D. (Block Leader, Molecular Biology)
- Smitha Krishnamurthi, M.D. (Cancer Biology)
- James Liu, M.D. (Reproductive Biology)
- Anna Mitchell, M.D. (Genetics)
- Aditi Parikh, M.D. (Genetics)
- Ajay Sood, M.D. (Endocrinology)
- JoAnn Wise, Ph.D. (Molecular Biology)
- Stuart Youngner, M.D. (Bioethics)

1. Please address last year's Action Plan. Did you accomplish the goals that you listed? Why or why not?

All of the changes listed in last year's Action Plan were implemented:

- replaced the medium size groups (MSGs) with four team based learning (TBL) exercises
- MSG lectures were incorporated into the TBL introductory lectures in weeks 6 and 7
- The molecular biology lectures, which have traditionally all been given in the first week, were split between weeks 1 and 5. Foundational material (primarily review of DNA replication and basic mechanisms of gene expression) was presented in week 1, while the more advanced/current information centered on mis-regulation of gene expression was presented in week 5, closer to the relevant IQ cases.
- clinical immersion activities were eliminated
- added a new lecture, Introduction to Pharmacology, to the first week of Block 2. This was added in response to a request from the SCME. This lecture replaced the Block 1 post-exam review, which was held later in the block.

Additional changes included:

- the presentation order of a number of the lectures was changed to better coordinate with the IQ cases
- two molecular biology lectures were combined in order to add an additional lecture on pregnancy
- MCQs and SEQs were 'tagged' to assist in coordinating with weekly content
- A **new format for EBIQ** was introduced this year. The goal of this format was to provide guidance as to how to critically evaluate different types of papers (reviews, clinical trials, etc.). Individual templates were created for each style of paper by Dr. Colleen Croniger and a second year student as part of a summer M2 research project to build upon the conceptual framework taught in Block 1. Rather than choosing papers

on their own, a paper from the recommended reading list was assigned for each week. One student presented the EBIQ, but all students were asked to read the paper and answer a brief series of questions on the provided template. This pilot was a success overall, but some changes in the reading assignments will be made next year.

2. Please comment on 2-4 aspects of the Block that went particularly well. Do you have plans to expand/increase/improve these aspects of the Block?

Genetics and Cancer Biology continue to receive especially strong ratings (4.4), and Endocrinology (4.2) and Reproductive Biology (4.1) were also rated highly. These four disciplines provide the primary content of Block 2 IQ cases, which were viewed as very effective (87% of students rated them as performing well or very well). Our faculty members are highly committed and are seen as being very 'approachable'. There is still room for improvement in each of these areas, and we will continue to work on better integration of all disciplines. In both the mid-block in-person feedback sessions and the written end of block feedback, students commented on how they appreciated having the framing lectures the week prior to the relevant IQ cases. This will be maintained in the coming year.

Non-Block 2 content: Student assessments of Anatomy were also more positive than last year; negative comments primarily revolved around the fact that the current Anatomy curriculum does not align well with the focus of Block 2 (e.g. reproductive biology). The lack of alignment is due to practical considerations: the dissection of the thorax is considerably easier than the pelvis region. During the Integrated Curriculum Retreat the leaders of Blocks 2 and 7 discussed how best to integrate content of the two blocks once the new Health Education campus is complete and a concrete plan was developed for implementation. Ratings for Bioethics also improved. This may be due to the reduction of the number of bioethics learning objectives included in the IQ cases. In previous years, many of these LOs were viewed by the students as redundant or forced, so last year IQ cases were critically evaluated and only the most relevant bioethics LOs were retained.

3. Please comment on aspects of the Block that received decreased ratings when compared to previous years. What are possible explanations? How will you address these?

The only discipline that received a much lower than normal rating was Development. Based on the comments in the end of block feedback, this is most likely due to students' reaction to the Development exam questions, which, in contrast to student expectations, focused on normal rather than abnormal physiology. Feedback on the Development lectures was very positive ('particularly enjoyable', 'great', 'particularly well done', 'excellent'). Areas with decreased ratings included Cell Physiology and the Clinical and Basic Science Correlation Series, with Cell Physiology and Molecular Biology receiving lower ratings than other disciplines. Based on student feedback, this is not due to content, but rather to the perception that these disciplines are not well integrated into the IQ cases. While the connections may not be obvious from reading the IQ vignettes, lecturers in both disciplines explicitly mention points where their subject matter intersects with the rest of the course content, both verbally and by noting specific IQ cases and TBLs on their slides. We will examine the IQ cases to determine whether the interconnections could be clarified by rewording some of the IQ learning objectives, and information will be added to the IQ facilitators' guides regarding the molecular/cell biology concepts that should be brought out in IQ discussions. Comments on the optional Clinical and Basic Science Correlation presentations indicated that students who attended these found them valuable. These will be retained, but the schedule will be adjusted to better align them with the weekly content.

4. Please comment on any new curricular innovation(s) that you introduced into the Block this year. Did they work well? Will you continue them? (Note: this may overlap with #2 above).

There were two major curricular innovations introduced into Block 2 in 2016.

1. Reallocation of hours to add lectures on Pregnancy and Pharmacology, reducing one hour of Molecular Biology lecture and 1 hour of review. These changes were well received and will be maintained in the coming year.
2. Conversion of the Medium Size Groups (MSGs) into team based learning exercises (TBLs). This was a learning experience, but a good start overall, especially given that none of the facilitators had any experience with this format. Just-in-time feedback for TBLs #1, 2, and 4 was very positive, but TBL #3 was considered overly challenging and did not fare well.

Just-in-time feedback evaluations:

- TBL #1: TBL effectiveness – 4.2 faculty effectiveness – 4.2
- TBL #2: TBL effectiveness – 4.1 faculty effectiveness – 4.2
- TBL #3: TBL effectiveness – 2.2 faculty effectiveness – 3.6
- TBL #4: TBL effectiveness – 4.0 faculty effectiveness – 4.2

Despite the generally encouraging just-in-time student feedback, the effectiveness of TBLs was rated very low in the end of block evaluations (2.9). This is slightly lower than the average rating of MSGs over the past few years. This disparity may be due to the low ratings for TBL #3 and/or the timing of the EOB feedback, which was opened the day after the exam was administered (see #5 below). Based on student and facilitator feedback, it is clear what adjustments need to be made and all four TBLs will be revised prior to next year. The content covered previously in the Genetics/Molecular Biology MSGs (now TBL #1 and 2) is not particularly suited for a TBL format, but we experimented with various ways of handling questions with clear-cut answers (e.g., risk calculations) and have a good idea of what works and what doesn't.

The students were assigned preparatory reading, but many of them came to the TBL unprepared. The *use of IRAT (quiz) scratch cards* that will be turned in with their names on them may 'encourage' more students to do the reading ahead of time. We also recommend limiting the amount of assigned reading to a single article, either a review or short research paper. The students commented that highlighting the pdf file assigned for TBL#4 was very helpful; all assigned TBL readings will be annotated next year.

Based on the just-in-time feedback, most students found working through problems in small groups helped reinforce concepts introduced in lecture and IQ. *The area for improvement cited most frequently by both students and faculty was time management.* Because some groups take longer than others to arrive at their answers, the faster groups tend to have a lot of down time, and some students questioned whether TBLs were a good use of their time. Next year supplemental questions may be provided to make these side discussions more productive; these questions will then be provided as optional post-session review questions. In some rooms, faculty found it difficult to rein in extraneous conversation when it was time for large group discussions. Recommended changes include use of specific time limits for each question (projecting a timer), provision of some means to indicate when each small group has finished discussing a question, and the use of microphones by all facilitators.

Other recommendations include:

- providing succinct goals for each session online (review at the beginning of each session)
- projecting a brief summary of take home points at the end of each set of related questions
- avoiding ambiguity in questions and answer choices by having non-experts examine them (observer comments can also be helpful in this regard)

5. Are you planning any changes to your required resources?

Most of the TBL rooms are not designed for these activities. We suggest considering other rooms in the medical school (e.g. seminar rooms in the Wood building). All facilitators should be supplied with portable

microphones. Required readings will be revised as necessary to accommodate changes in course content and the new EBIQ format.

6. Please comment on observations of student attendance and student participation. Was it similar to the preceding year?

Except for optional review sessions, student attendance and participation was excellent and similar to last year.

7. Please comment on the alignment between the weekly Block content and the MCQs/SEQs.

The MCQs and SEQs were tagged so that they would align with the course content. However, the placement of a few of the lectures was changed in the late spring and some of the MCQs failed to track with them. The lecture order will likely remain the same in the coming year and the MCQs will be coordinated with them.

8. What additional information or comments do you want to share about the Block?

During IQ and feedback sessions students indicated that they liked having relevant lectures prior to the IQ cases. IQ facilitators also commented that the students seemed better prepared. The lecture schedule will remain largely unchanged in the coming year.

We will be welcoming two new members of the Block 2 design team in 2017. Patricia Marshall, Ph.D. will be taking over for Stuart Younger, M.D. We thank Stuart for his efforts to modify the bioethics component of our IQ cases and look forward to tapping into Dr. Marshall's expertise as we continue to evaluate the Bioethics portion of the block. Sherif El-Nashar, M.D./Ph.D will be joining the Reproductive Biology group, taking over Angelina Gangestad's myriad roles. The transition should be a smooth one, as Sherif has been working closely with Lina over the past year. Our sincere thanks go out to Lina, who has been an indefatigable contributor to Block 2 for many years. We will sorely miss her.

Additional changes will be made to next year's curriculum. These include:

- team based learning (TBL) application exercises will be revised based on student and faculty feedback
- a preparatory lecture will be added prior to TBL #3 (Cell signaling in cancer).
- MCQs and SEQs will be updated to reflect changes in the curriculum (e.g. TBLs)

We also suggest two changes to the end of block feedback:

- open the feedback site on the Monday following the exam, rather than the day after the exam (Friday), so that students have time to reflect on the block as a whole, rather than focusing their feedback on the exam.
- revert to inviting the entire class to fill out the end of block feedback to provide instructors with more comprehensive information about students' perceptions of the block and to provide all students with an opportunity to share their opinions and suggestions. Their written comments are particularly helpful.

We want to express our sincere gratitude to the members of our design team for their dedication, responsiveness, and hard work. Their largely unheralded contributions are what make this block work so well. Course manager Nivo Hanson does an incredible job of supporting us and gently keeping us on track. She is a pleasure to work with and is instrumental in making this block a success. Other faculty members contributing to the block are highly committed and do an excellent job. We also gratefully acknowledge the considerable support received from the office of assessment, especially Dr. Klara Papp and Katie Battistone, the IQ program manager, Bart Jarmusch, and the IT technical support team.

11. Longitudinal Evaluation Data on next page

Percentage of Students who rated “Good” or “Excellent”

Block 2: The Human Blueprint				
General Block Aspects				
Block Components	2013-2014	2014-2015	2015-2016	2016-2017
	%	%	%	%
Approachability of faculty	89	85	89	77
Effectiveness of large group lecturers	77	64	78	62
Effectiveness of IQ cases	92	92	96	87
Effectiveness of team-based learning (TBL) group activities	--	--	--	30
Overall quality of this block	75	65	78	55
Block Concepts/Integration of Block Concepts and Longitudinal Themes				
Endocrinology—Concepts & IQ*	94	94	92	81
Reproductive biology —Concepts & IQ*	81	91	84	79
Development —Concepts & IQ*	58	44	53	26
Genetics —Concepts & IQ*	93	97	93	94
Molecular Biology —Concepts & IQ*	54	56	63	57
Cancer Biology —Concepts & IQ*	92	91	91	92
Cell Physiology —Concepts & IQ*	61	63	63	60
Clinical & Basic Science Correlation Series —Concepts & IQ*	60	70	64	64
Gross Anatomy	43	54	59	66
Histopathology	77	61	76	75
Bioethics	58	29	41	47

* “Well” or “Very Well”

*Scale changed in 2015-16 to “Well or Very Well” from “Good or Excellent”