

The ABMGG's response to a commentary on the decision to create a 24-month specialty of Laboratory Genetics and Genomics

To the Editor: The American Board of Medical Genetics and Genomics (ABMGG) thanks the editors of *Genetics in Medicine* for the opportunity to respond to the commentary in this issue regarding the new training program in Laboratory Genetics and Genomics (LGG).¹ The ABMGG always endeavors to act in the best interest of the profession and to ensure that individuals and training programs certified and accredited by the ABMGG are of the highest quality. The ABMGG Board of Directors is composed of individuals with expertise in their respective fields, including at least nine directors who are certified laboratory geneticists. This group includes a minimum of three clinical cytogeneticists, many of whom have been fellowship training program directors.

We are very fortunate to be living in an era of transformative progress in diagnostic technologies that allow us to provide ever more rapid and accurate diagnoses to many individuals. Various technological advances, such as chromosomal microarray and next-generation sequencing methods, have vastly increased the diagnostic rate for individuals with constitutional disorders. For those affected by cancer, these two techniques can significantly improve outcomes through precision medicine. For couples planning a family, unprecedented testing now enables them to make informed reproductive decisions.

Therefore, it has become clear that we are at a critical juncture where we must work toward ensuring that those who graduate from clinical fellowship programs are able to effectively utilize, integrate, and accurately interpret data from these new techniques. Recognizing that the traditional fields of clinical cytogenetics and clinical molecular genetics increasingly use similar techniques to assess for single-nucleotide variants, copy-number variants, aneuploidies, and absence of heterozygosity, the ABMGG decided to merge the training of cytogenetics and molecular genetics into a single specialty called Laboratory Genetics and Genomics (LGG).

The decision to merge the two specialties has been under serious discussion for a number of years. The Board's process included a report from an "emerging technology" working group of laboratory specialists (2011) and surveys of clinical fellowship program directors and training directors to determine current practices and training needs (2010). In 2012,

the ABMGG devoted a 3-day retreat to reviewing the potential benefits and challenges of such a change. In 2014, a meeting at the Banbury Conference Center of representatives of the major genetics professional societies as well as other experts in medical genetics and genomics convened to discuss approaches to training in clinical and laboratory genetics. One of the recommendations agreed on was that cytogenetics and molecular genetics training should be unified into an integrated training program, thus confirming strong support for ABMGG to move forward with a merged specialty.

The latest ABMGG survey directly addressed the required content and length of training; it was distributed in 2014 to the program directors of all accredited molecular genetics and cytogenetics training programs, with responses received from more than 65% of programs. Working with the Association of Professors of Human and Medical Genetics, the ABMGG communicated and consulted regularly with the Laboratory Fellowship Program Directors since 2010. These discussions made evident the need to innovate the clinical laboratory training and integrate experiences in what have been traditional clinical cytogenetic and molecular techniques, rather than having fellows with separate experiences in each. When an application for the new specialty of LGG was submitted to the American Board of Medical Specialties in 2015, the American College of Medical Genetics and Genomics (ACMG) provided a strong letter of support, as did several leaders in our field, including diplomates certified in cytogenetics and/or molecular genetics. In addition, many other Boards, including the American Board of Pathology, submitted comments supporting the proposed specialty, content, and duration of training.

The content of the training and the individualized LGG curriculum afford flexibility in training in this clinical specialty. This includes allowing up to 6 months (of the 24 months) that programs and fellows can use to concentrate on augmenting clinical laboratory skills in a focused area or to pursue a specific clinical experience that aligns with an individual's career goals (e.g., additional time working in cancer diagnostics or prenatal diagnostics). As diagnostic laboratory testing technologies, the menu of available tests, and specialized literature continue to grow rapidly, many laboratory directors now focus their efforts on specialized content areas (e.g., cancer, prenatal) or technologies (e.g., microarrays, exome analyses), and it is increasingly common for cytogenetics or molecular genetics clinical laboratory directors to specialize their practice in some manner.

With respect to the concern regarding the lack of a dedicated research experience within the 24 clinical months of the LGG fellowship, the experience reported by clinical laboratory fellowship directors, confirmed by the results of the 2015 ACMG Salary Survey, indicates that an increasing number of graduates from ABMGG clinical laboratory fellowships now

seek positions with private/commercial (nonacademic) clinical diagnostic laboratories. These laboratories generally do not have research requirements or obligations for laboratory directors. In fact, even in many academic diagnostic laboratories, research opportunities and protected time for clinical laboratory directors are limited. Fellows who enter clinical laboratory training programs typically have spent at least 4 years in research during their doctoral training, and many will have obtained post-doctoral research experience as well. Thus, it was felt that there is limited benefit to an additional 6 months of research during the clinical training.

That said, as outlined in the Frequently Asked Questions document on the ABMGG website, although 24 months of clinical training is the minimum for a fellow to be credentialed to sit for the certification examinations, programs are free to offer a longer period of clinical training that incorporates research or to require an additional year of dedicated research training after the 24 months of clinical training have been completed. Indeed, we believe that clinical laboratory fellowship programs should provide career counseling to their trainees, including identifying individuals inclined toward an academic career so that they can be nurtured, supported, and primed to succeed through participation in additional research experiences. Finally, the ABMGG does not consider areas such as bioinformatics, data curation or quality assurance, or control or improvement activities to be "research." Rather, they are bodies of knowledge and skill sets that are required for directing a diagnostic laboratory, and, as outlined in the ABMGG learning guide, they should be integrated into the clinical training.

After much deliberation, which included input from currently practicing laboratory directors, program directors, and laboratory specialty training directors, a minimum duration of 24 months of clinical training was established for the new specialty of LGG. However, simply *completing* the 24 months of training is not sufficient to become a clinical laboratory director. The program director and training director must assess the progress of the fellows at least every 6 months and document that the fellows are achieving milestones (developed by the Laboratory Program Fellowship Training Directors Special Interest Group in collaboration with the ABMGG) and acquiring required skills and knowledge. Directors also must attest that these requirements have been fulfilled satisfactorily by the end of a fellow's training period. Individuals seeking board

certification must submit a logbook of clinical cases to be eligible to take the certification examination and then pass a challenging examination to become board-certified. Finally, after achieving a position as a clinical laboratory director, continued learning, seeking thoughtful mentorship from senior laboratory geneticists, and sustained scientific growth are hallmarks of any career in diagnostic genetics, whether that career develops in an academic or commercial setting.

In conclusion, we believe that 24 months will be sufficient training time to acquire the required skills and knowledge to serve as a laboratory director. Furthermore, for well over two decades, it has been the policy of the ABMGG that an individual's training in a single specialty can be followed by a 12-month fellowship in a second specialty in order to achieve additional certification. This group has included physicians who completed their clinical genetics training and went on to complete training in a laboratory specialty in only 12 months, often with little or no prior laboratory experience.

The directors of the ABMGG join with the community of current and future geneticists in looking forward to this exciting transformation in diagnostic testing. We are committed to an evolution in the training and certification of the next generation of laboratory geneticists to ensure that they have the knowledge and skills to best serve the public. We welcome the genetics community to visit the ABMGG website at <http://www.abmgg.org> to learn more about the new LGG fellowship.

DISCLOSURE

The authors declare no conflict of interest.

V. Reid Sutton, MD¹ and Miriam G. Blitzer, PhD²; on behalf of the Board of Directors of the American Board of Medical Genetics and Genomics

¹Chair, Board of Directors, American Board of Medical Genetics and Genomics, Bethesda, Maryland, USA; ²Chief Executive Officer, American Board of Medical Genetics and Genomics, Bethesda, Maryland, USA. Correspondence: Miriam G. Blitzer (mblitzer@abmgg.org)

REFERENCES

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