

Scientific Life

Developing cultural
humility in
immunology and
STEMM mentoring

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Cultural humility allows a better understanding and appreciation of others, as well as fostering positive interactions with different kinds of individuals. Here, we discuss the difficulties faced by persons excluded because of their ethnicity or race (PEERs) in immunology and science, technology, engineering, mathematics, and medicine (STEMM), as well as the importance of cultural humility in research and academia.

Acquiring cultural humility

Acquiring cultural humility allows both PEERs and non-PEERs to improve their grit, focus, and goal outcomes. It can also promote a successful mentee–mentor relationship in immunology and other STEMM fields [1], a process requiring humility from both mentor and mentee. The dynamics of the mentoring relationship may differ depending on the academic status of the mentee. For example, an undergraduate student may have different needs from a postdoctoral fellow and mentors must adapt to meet their mentees' individual needs with cultural humility. In this article, we offer suggestions for becoming fully responsible for one's actions and recommend solutions for creating and promoting an environment of greater cultural humility. Furthermore, we introduce the concept of the cultural quotient (CQ), which blends cultural contexts and different attitudes to gauge social interaction skills and measure cultural humility [2].

The National Institutes of Health (NIH) states that cultural humility is a continuous journey of self-reflection and self-critique, whereby an individual acquires knowledge of other cultures and delineates their beliefs and cultural identities. The goal of increasing cultural humility is to recognize that values and beliefs are shaped by the cultures to which one has been exposed and to acknowledge that this exposure increases the ability to empathize with others [3,4]. Because of changing demographics and increased interactions between cultures, cultural humility has become a vital skill in all areas of society but here we focus on cultural humility in science across business, industry, and academia [3,4].

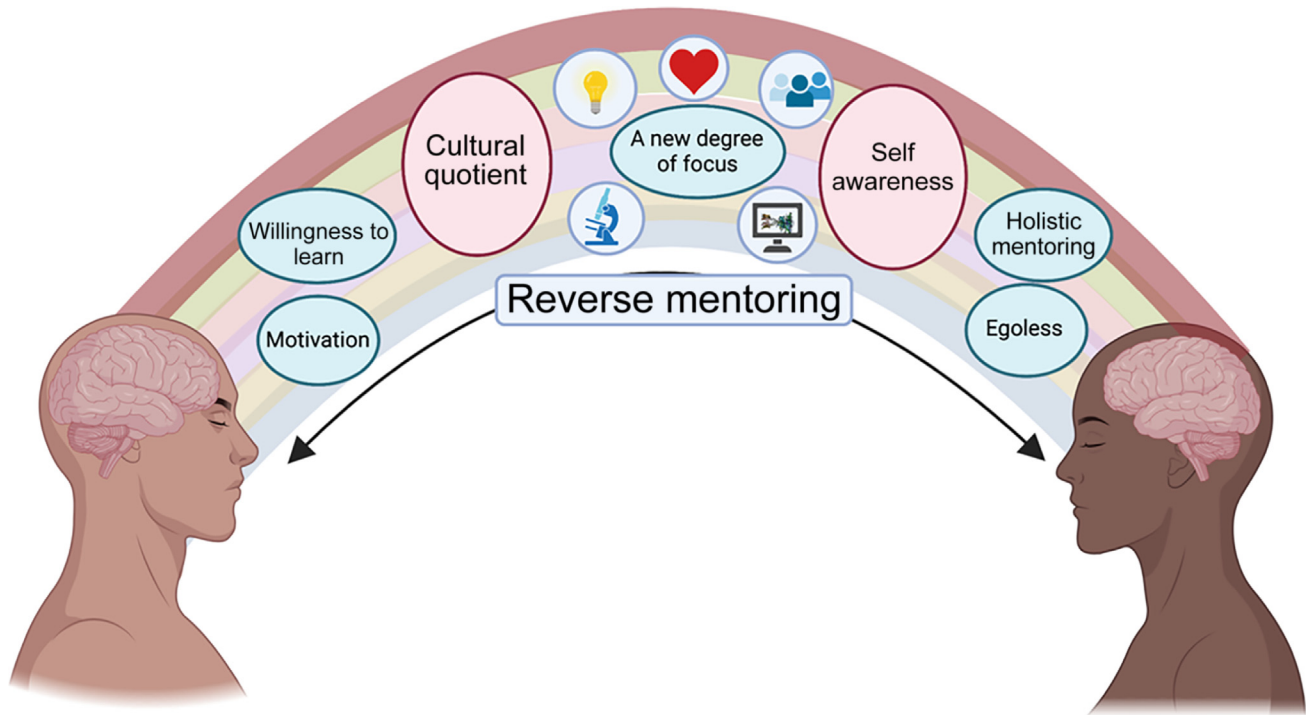
Culture is defined as shared knowledge leading to the generation of customs, traditions, and values that influence everyday behaviors and choices [5]. We posit that the relationship between a mentor and a mentee is most effective when the mentor fosters an environment that promotes cultural humility, which requires maintaining a growth-focused mindset, being self-aware and egoless, and engaging in supportive interactions whether online [6], in person [7,8], or during uncertain times [9]. For example, a mentor might schedule a laboratory meeting for 7 am without considering that the staff might have families, whereas a mentor with cultural humility would ask the appropriate times for which the staff might be available to meet. As another example, a mentor might incorrectly deem cultural hairstyles such as braided hair, afros, or dreadlocks as being unprofessional. By contrast, gaining cultural competency and humility enables a mentor to respect cultural hairstyles with which they might not identify. Importantly, through cultural competency, cultural humility allows an improved understanding of an individual's experiences from a different perspective.

Indeed, cultural humility requires deep reflection and continuous improvement. We suggest scenarios in which a mentor can

foster cultural humility within a team by organizing writing accountability groups and diversity, equity, and inclusion (DEI) social meetings (e.g., on a Friday time-slot that might be more casual). This reflection can be done individually or through team-building exercises. During such, one can grow by engaging in dialogue about cultural biases and asking questions to understand others' traditions and values. For example, a laboratory group could use 'DEI Fridays' to learn about others' cultures and traditions and discuss the newest research done in DEI and STEMM education, as well as in outreach spaces. During these discussions, the mentor can learn about topics that affect mentees or highlight published research from PEERs. The laboratory can also practice cultural humility by performing volunteer work at STEMM education events in the community and encourage professional and career development opportunities.

Special meetings can be held to focus on skills that increase cultural humility, such as improving communication skills and learning to say no to overcommitment [10]. For example, assays concerning antineutrophil cytoplasmic antibodies should be processed in a timely manner and laboratory members should be prepared to say no to other time-sensitive tasks. Continuous career and professional development allow awareness of elements that are needed for research. Using professional development and holistic mentoring to hold conversations about cultural humility can enhance the learning environment and create a more responsive teaching environment in the laboratory [8].

Finally, interdisciplinary immunologists can benefit from cultural humility by creating a laboratory environment that fosters reverse mentorship (Figure 1). Reverse mentorship involves a mentee providing information and training to a mentor who is willing to learn and listen (Figure 1). For example, a well-trained immunologist might need a



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Figure 1. Reverse mentoring in the laboratory. Mentorships in the laboratory should work both ways. This illustration depicts the pragmatic approach that mentees and mentors can use to share ideas in the laboratory, at conferences, in laboratory meetings, or while writing articles in 'writing accountability groups'. Figure created with BioRender.com.

postdoc that is well versed in machine learning and artificial intelligence to teach them how to utilize Alpha Fold 2 or focus ion beam scanning electron microscopy when examining 3D crystal structures or 3D reconstructed B and T cells. In this instance, the mentee becomes the teacher and applies their knowledge to the scientific process. This results in a symbiotic relationship that allows mentor and mentee to teach and learn from each other, thus fostering trust and allowing individuals to become agents of cultural humility.

Moreover, because individuals join a specific work culture at different points (e.g., research career), cultural humility exists on a spectrum and, thus, requires continual learning, unlike cultural competency, which has an expected endpoint. In our view, achieving this type of balanced perspective signifies a lifelong commitment

to self-reflection and self-improvement. Indeed, contemplating how a scientist's culture relates to that of other work cultures is important and is essential for achieving cultural humility.

CQ: embracing cultural diversity and camaraderie

The CQ is an additional approach for elevating cultural awareness. It measures how one uses critical thinking and problem-solving skills to better understand the behaviors and traditions of culturally diverse people across three primary aspects: cognitive, physical, and emotional/motivational [11]. We argue that the CQ can serve as a putative tool for mentors and mentees. Several frameworks for assessing CQ have been developed that rely on a questionnaire assessing the aforementioned cognitive, physical/behavioral, and emotional/motivational attributes [2]. Cognitive CQ

refers to the ability to devise learning strategies by identifying similarities and differences in others' behaviors and establishing connections between shared cultural understandings [2,12]. Physical/behavioral CQ is the incorporation of the habits and mannerisms of various cultures to promote acclimatization and improve the ability to work with others [2,12]. Emotional/motivational CQ describes the curiosity to learn about and connect with people of other cultures [2,11,12]. Interacting with individuals of diverse backgrounds increases CQ, which enables learning of intercultural differences and navigating different cultures in a productive, positive manner [12]. Thus, by assessing CQ, work environments can improve by increasing awareness of implicit biases and appreciating various multicultural scenarios, including body language and verbal cues. Such quantitative tools can serve as a

complementary aid for creating a welcoming and inclusive learning environment.

Furthermore, increasing CQ scores is particularly important at a time when education and work tasks are being performed virtually [13], which can make communication more difficult (e.g., reading body language, noticing subtle cues, and clearly hearing others). While there is no substitute for in-person interactions, technology has improved cross-cultural communication with the increased use of platforms for online video chatting [6]. Communication across the world has become easier and more cost-efficient with enhanced virtual communication methods [6]. Because many STEM fields involve collaborators from diverse geographies and cultural and ethnic backgrounds working together on a global scale, methods for elevating cultural humility, respect, and acceptance, are necessary. Mentors in STEM fields form the foundation of their institutions' cultures and establish the mission, values, and expectations that must be upheld. Therefore, we propose that mentors with advanced CQ scores serve as examples in bridging cultural divides by building interpersonal connections between disparate groups and helping achieve their institutions' goals, even virtually [3–9,14].

Concluding remarks

Maximizing the effectiveness of mentorship and ensuring the success of mentees in their research careers requires mentors to utilize cultural humility. As previously stated, mentors should aim to improve their own cultural humility through constant reflection on other cultures and challenging their own beliefs [7]. By developing cultural humility, the mentor and mentee can refine their perspectives as they come to understand the importance of creating an inclusive environment representative of diverse cultures. A mentor who appreciates the power that cultural humility yields can see that their own road is not a predestined map, but rather,

an evolving path. Mentors and mentees should aim to recognize that many viewpoints must be considered to create a cohesive and productive relationship. Self-awareness and adapting to different social situations while remaining considerate of others are crucial attributes to developing an inclusive environment. Based on one's cultural upbringing, a mentor with a high degree of cultural humility can recognize subtle cues signaling discomfort, disagreement, or disinterest in the conversation. After reading these social cues, the mentor can use cognitive strategizing to adjust word choices and mannerisms to help the mentee flourish in a new environment. Moreover, learning how to acknowledge diverse cultures can help build camaraderie and collegiality, leading to long-lasting relationships that engender trust and optimize an organization's goals. Mentors must recognize, however, that cultural humility is an ever-evolving ideal that they must work toward.

Cultural humility and its associated quotients exist on a spectrum, and a large component of progressing toward cultural humility is understanding that it is an ongoing, reflection-based process. A good mentor helps their mentees grow by providing unique and inclusive experiences in the laboratory. In addition, mentors can assess the progression of cultural humility by creating a trusting environment to ensure that mentees thrive. The techniques presented here are intended to help increase cultural humility and facilitate successful mentoring [7–9,14]. Indeed, we argue that when mentors develop cultural humility, their mentees can achieve better outcomes and greater scientific research progress. Furthermore, encouraging cultural humility allows mentors to transform their leadership progress while pushing science and research forward.

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