National Cancer Advisory Board (NCAB)
***ad hoc* Subcommittee on Experimental Therapeutics**

31 August 2022
11:00 a.m.–12:00 p.m. EDT
Virtual Meeting

DRAFT SUMMARY

Subcommittee Members
Dr. Amy B. Heimberger, Chair
Dr. Francis Ali-Osman
Dr. Rose Aurigemma, Executive Secretary
Dr. Nilofer S. Azad
Dr. Anna D. Barker
Dr. Howard J. Fingert
Dr. Andrea A. Hayes (absent)
Dr. Scott W. Hiebert (absent)
Dr. Nikan Khatibi (absent)
Dr. Nancy J. Raab-Traub

Other Participants
Dr. Oliver Bogler, National Cancer Institute (NCI)
Dr. John D. Carpten, NCAB
Dr. Luis Alberto Diaz, Jr., NCAB
Dr. James H. Doroshow, NCI
Ms. Shayla Duncan, NCI
Dr. Paulette S. Gray, NCI
Dr. Douglas R. Lowy, NCI
Ms. Anne Lubenow, NCI
Mr. Patrick McGarey, NCI
Ms. Thu Nguyen, NCI
Mr. Ricardo W. Rawle, NCI
Dr. Dinah S. Singer, NCI
Dr. Ashani T. Weeraratna, NCAB
Dr. Karen M. Winkfield, NCAB
Ms. Joy Wiszneauckas, NCI
Dr. Tamara Korolnek, The Scientific Consulting Group, Inc., Rapporteur

Welcome and Introduction to the Day's Topic
Dr. Amy B. Heimberger, Subcommittee Chair, Northwestern University Feinberg School of Medicine, and Ms. Joy Wiszneauckas, Deputy Committee Management Officer, NCI

Ms. Joy Wiszneauckas called the meeting to order at 11:00 a.m. EDT. Ms. Wiszneauckas noted that the meeting is public and is being videocast and recorded. Members of the public who wish to express their views on any items discussed during the meeting can do so within 10 days of the meeting by contacting the Executive Secretary of the NCAB.

Dr. Amy B. Heimberger, Subcommittee Chair, welcomed all participants and noted that the purpose of the meeting is to discuss improved training in translational research. Dr. Heimberger noted that challenges in translational research include investigators' losing commercialization potential because of a lack of understanding of intellectual property regulations and researchers' spending considerable time and effort on projects with no clinical relevance.

Review of Expertise and Special Interest(s) in the Subcommittee's Mission
Dr. Rose Aurigemma, Associate Director, Developmental Therapeutics Program, Division of Cancer Treatment and Diagnosis (DCTD), and Dr. Amy B. Heimberger, Subcommittee Chair, Northwestern University Feinberg School of Medicine

Dr. Rose Aurigemma, Subcommittee Executive Secretary, presented an update on cellular therapies for solid tumors—a priority topic identified by the NCAB *ad hoc* Subcommittee on Experimental Therapeutics—and upcoming funding opportunity announcements (FOAs) that resulted from this

initiative. She informed the Subcommittee that the NCI has hosted several workshops and published a white paper related to this topic and has identified several areas of unmet need, including preclinical and translational research to advance cell therapy for solid tumors, proof-of-concepts studies for new treatment approaches, enhancement of cell manufacturing technologies, identification of new biomarkers, and imaging-based detection of experimental therapies. Needed NCI services include standardization of cell product characterization and access to core laboratories; quality control testing for cell therapy agents; vector and cell therapy production services; and guidance for investigators on preparing investigational new drug submissions.

To address these needs, three companion FOAs for the Cancer Adoptive Cell Therapy Network (Can-ACT) have been posted, including the Can-ACT for Adult Cancers (RFA-CA-22-028), Can-ACT for Pediatric Cancers (RFA-CA-22-029), and Can-ACT Coordinating Center (RFA-CA-22-030). Can-ACT will comprise seven Exploratory and Developmental Phased Award Cooperative Agreements (UG3/UH3) for adult or pediatric cancers, managed by a single U24 Coordinating Center and supported by a Cellular Immunity Core at the Frederick National Laboratory for Cancer Research. Funding will support intra-network collaborations; working groups will address common goals, challenges, and opportunities; and the sharing of tools, reagents, data, and resources will be encouraged. An informational Webex session will be held at 4:00 p.m. EDT on September 7, 2022. The NCI intends to fund the awards by late spring of 2023.

Dr. Heimberger reviewed new priority topics for consideration by the Subcommittee. She explained that translational research training, ranging from target and drug discovery to the late-stage development of therapeutics, is an unmet need. Translational research encompasses activities in which most scientists are not trained, and many researchers are unfamiliar with key steps or metrics to evaluate translational research, which include consideration of such elements as reproducibility, clinical relevance and indication, competitive landscapes, return on investment, intellectual property, regulatory and privacy issues, and funding alignment along the research continuum. Dr. Heimberger informed the Subcommittee that the objectives for the current meeting are to evaluate whether the NCI can serve as a key hub for basic translational training via an electronic format, which might include archiving a library of topics for rapid access, harmonizing training, reducing redundancies by developing a nationwide curriculum, and facilitating instruction by leaders in the field. NCI-Designated Cancer Centers with unique experience in a given domain will have the opportunity to become part of the nationwide curriculum, which can be built on current educational programs offered by the NCI.

In response to increased demand for knowledge related to translational science, a program has been developed at the Cancer Center level to provide funding, guidance, and training for translational research. The NCI's Developmental Therapeutics Program is a preclinical development consultation service that provides confidential guidance in the development of a broad range of products (e.g., small molecules, biologics, cell therapies, imaging agents, nanotechnology products). In approximately 3.5 years, the service has received 264 requests and provided 149 consultations to academic, industry, and government researchers across the United States and the world. Discussion topics that are most often requested include communication with the U.S. Food and Drug Administration (FDA), preclinical toxicology and pharmacology, and efficacy and proof-of-concept studies, as well as scale-up synthesis and good manufacturing practice (GMP).

Presentation from the Director, Center for Cancer Training
Dr. Oliver Bogler, Director, Center for Cancer Training (CCT)

Dr. Oliver Bogler reported on training activities supported by the CCT. He described the intramural Interagency Oncology Taskforce Fellowship (IOTF), which is a partnership between the NCI and the FDA to bring safe and effective treatments from the bench to the bedside as quickly as possible. The

program, which is a 2-year fellowship to train scientists in research and research-related regulatory policies and regulations, has had 70 graduates to date. Most graduates achieve positions at the FDA or in the biomedical industry.

Dr. Bogler reminded the Subcommittee that the NCI supports extramural cancer training at multiple career stages through multiple funding mechanisms. Of 1,572 active cancer training awards from the CCT and the Center to Reduce Cancer Health Disparities in January 2022, two K12 awards have led to eight patents, two R25 awards have led to four patents, and 29 T32 awards have led to 78 patents. Notably, these patents are focused on training in cancer research that is not necessarily on the translational continuum. NCI K08 awards under three program announcements presently are funding 166 clinical trials. Current program announcements include PA-20-201 (Parent K08 Independent Basic Experimental Studies with Humans Required), PA-20-202 (Parent K08 Independent Clinical Trial Required), and PA-20-203 (Parent K08 Independent Clinical Trial Not Allowed).

Dr. Bogler informed the Subcommittee that a weeklong Methods in Clinical Cancer Research Workshop (i.e., Vail Workshop) sponsored by the American Association for Cancer Research and the American Society of Clinical Oncology is held annually to educate and train early-career investigators on best practices related to clinical design. In a paper recently published in the journal *Clinical Cancer Research*, workshop organizers reported that from 1996 to 2014, 1,932 students from diverse backgrounds attended the workshop. Significant improvement in the students' level of clinical trial knowledge from the pre- to post-workshop exams was measured. Long-term follow-up indicated that more than 92 percent of students were involved actively in patient-related research, and that 66 percent had implemented five or more clinical trial protocols.

In response to a question from Dr. Heimberger, Dr. Bogler discussed an internal CCT curriculum for intramural investigators. This course, titled "Translational Research in Clinical Oncology," is a broad survey of the clinical oncology research landscape. Dr. Bogler noted that this course could serve as a foundation for more in-depth educational programs.

Dr. Francis Ali-Osman asked whether the IOTF course was intended for early-stage or more established investigators. Dr. Bogler responded that the fellowship primarily was offered to senior postdoctoral scientists, who are embedded with the FDA to learn about regulatory policies. Dr. Ali-Osman pointed out that more established investigators might benefit from more specialized courses with less intensive requirements. He added that later-stage researchers also would benefit from expertise in this area.

Consideration of Topics for Future NCI Experimental Therapeutics Support
Dr. Amy B. Heimberger, Subcommittee Chair, Northwestern University Feinberg School of Medicine

Dr. Anna D. Barker began the discussion by noting that when the NCI Alliance for Nanotechnology in Cancer was established, a Nanotechnology Characterization Laboratory (a collaborative effort among the NCI, FDA, and National Institute of Standards and Technology) also was launched to provide preclinical characterization and safety testing to researchers in the nanoparticle field. Dr. Barker wondered whether an opportunity exists to establish a similar laboratory for cell therapies to help resolve issues related to standardization and scaling. Dr. Barker commented that several Cancer Centers possess scale capacity that could be leveraged by the NCI and cancer research community. She added that checkpoint inhibitors for cancer treatment likely would not have been developed without support from the NCI's Rapid Access to Intervention Development (RAID) Program and expressed her hope that the NCI would continue to play a role in fostering novel cancer therapeutics.

Dr. Heimberger commented that many cancer researchers are not aware of the range of NCI initiatives and programs (e.g., RAID) available to support them. An NCI-based curriculum could educate investigators on available resources from such institutions as the NCI and FDA.

Dr. Ali-Osman noted the challenges associated with cell therapies—such as the inability to perform preclinical work in animal models—and wondered how cell therapies could be advanced and supported. Dr. Heimberger remarked that a funding opportunity to develop preclinical models for cell therapies might be helpful.

Dr. John D. Carpten expressed his interest in the training fellowship concept, especially because it might be used to support underrepresented minority researchers to enhance diversity in the biomedical research workforce.

Dr. Heimberger proposed a comprehensive NCI curriculum to provide investigators the necessary research, regulatory, and legal expertise to perform accelerated translational research. Customized courses, developed by individual Cancer Centers, might be required to address individual needs and to support scientists across the translational research continuum. Dr. Heimberger provided the example of a historically Black college or university developing a course to address diversity in such issues as clinical trial enrollment.

Dr. Barker reminded the Subcommittee members that the Vail Workshop also presents an opportunity for the NCI to connect with the needs of the translational research community. She added that the Cancer Center directors, who meet frequently, also could be involved in educational outreach. A discussion with the Cancer Center directors should be considered to better assess their needs and interest in a centralized NCI program.

Dr. Douglas R. Lowy, Acting Director, NCI, recommended that educational programs distinguish between the needs of investigators operating at different points along the translational cancer research continuum. Preclinical scientists require different information than researchers establishing clinical trials; resources must be developed so that investigators can acquire the information and expertise that they need. Dr. Karen M. Winkfield suggested that Cancer Center directors be educated about the need to provide support for the intellectual property needs of cancer researchers and, in turn, spread this awareness to research institutes. In response, Dr. Heimberger highlighted the fact that many researchers are not aware of gaps in their own translational research knowledge. These major knowledge gaps should be addressed in the core of the curriculum, which could be followed by more focused, need-based educational programs. Dr. Bogler noted that the R25 Cancer Research Education funding mechanism, particularly the courses for skills development (e.g., the Vail Workshop), might be worth exploring as a model for the curriculum. Courses could fall along the translational research continuum and researchers could enroll in courses according to their needs.

Dr. Lowy mentioned that many scientists are not aware that their research programs have the potential for clinical development. A formal process involving an external body of experts—similar to those found within the NCI Technology Transfer Center—should be developed to advise investigators about the clinical potential of their research.

Dr. Barker noted that many of the proposed initiatives already are available through the NCI and highlighted the need to advertise these services to the scientific community, possibly via the Cancer Centers. She referenced RAID and the Development Therapeutics Program as examples of such NCI efforts.

Dr. Aurigemma recommended that all translational researchers be taught basic quality assurance and regulatory science. Dr. Heimberger asked Dr. Aurigemma for her thoughts about the time needed to

impart such a curriculum. Dr. Aurigemma referenced a 10-part weekly series hosted by the Developmental Therapeutics Program about developing novel treatments. She noted that the series was well received, but it covered topics broadly and was not interactive. Dr. Aurigemma also mentioned an online course offered by the Biopharmaceutical Development Program on GMP bioprocessing. She added that online instruction related to developing small molecules was a significant gap.

Dr. Bogler stated that one strength of such models as the Vail Workshop is that they employ characteristics of adult learning, including learning that relates to concrete, real-world examples. At the Vail Workshop, investigators are required to bring a protocol to develop as part of the curriculum. He encouraged the Subcommittee to develop similar educational programs.

Referencing the incorporation of real-world experiences into regulatory training, Dr. Aurigemma noted that the NCI recently has announced that it is recruiting for 2-year fellowship positions with the Biopharmaceutical Development Program for training in bioprocessing, regulatory affairs, and quality assurance. Additionally, the FDA has contacted the NCI to request that new FDA staff members tour the NCI cell therapy suites. She noted that educating institutional and Cancer Center leadership would be a more effective means of disseminating knowledge related to translational cancer research than training individual investigators. Dr. Heimberger expressed misgivings about this strategy. She commented that significant gaps relating to translational education exist at many Cancer Centers; institutional and Cancer Center leadership should rely on an educational foundation developed by the NCI to reduce redundancy, harmonize instruction, and provide a centralized way to educate researchers on resources available at the NCI.

Dr. Barker mentioned that most universities do not have the resources to establish laboratories that are compliant with good laboratory practice, much less GMP. She recommended that NCI programs be established to support postdoctoral positions in industry to develop an academic workforce educated in regulatory practices.

Dr. Howard J. Fingert commented that objective measures of performance related to translational cancer research (e.g., generation of substantial evidence, completion of clinical trials) should be incorporated to promotes success and innovation in the field. Dr. Heimberger agreed but added that the metrics should be aligned with where investigators are operating within the translational pipeline.

Dr. Fingert added that expertise is not static. Being able to provide expertise as a resource requires systematic thinking; leaders, educators, and program staff must continue the process of self-education.

Adjournment
Dr. Amy B. Heimberger, Subcommittee Chair, Northwestern University Feinberg School of Medicine

Dr. Heimberger adjourned the meeting at 1:00 p.m. EDT.

Dr. Amy B. Heimberger Chair	Date	Dr. Rose Aurigemma Executive Secretary	Date