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Nolta, Jan A

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Dr. Jan Nolta, Editor of STEM CELLS, is the Director of the Stem Cell Program at UC Davis School of Medicine and directs the new Institute for Regenerative Cures. The UC Davis stem cell program has over 150 faculty members collaborating to work toward stem cell-related cures for a spectrum of diseases and injuries. Her group focuses on “bench to the bedside” research, and she has been involved in numerous clinical trials of gene and cell therapy. She is scientific director of the new Good Manufacturing Practice clean room facility at UC Davis, where stem cells of different types are being isolated or expanded for clinical trials.

Correspondence: Jan A. Nolta, Ph.D., University of California Davis Health System, Stem Cell Program, Sacramento, California, USA. e-mail: jan.nolta@ucdmc.ucdavis.edu

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Research Leads to Approved Therapies in the New Era of Living Medicine

JAN A. NOLTA 

In 2017, the fields of cell therapy and gene therapy have seen the first products approved by the Food and Drug Administration and commercialized for insurance reimbursement. This marks a new shift in the era of “living medicines.” The fields of stem cells, immunotherapy, gene therapy, and regenerative medicine are poised to change the face of health care. Immunotherapy is giving terminal cancer patients a second chance at life, gene therapy can cure rare diseases, and living stem cells are beginning to be prescribed for certain indications. Gene editing offers unprecedented opportunity to alter stem cell genomes to make lasting cures for monogenic disorders, including countless rare diseases. This changes the fields of medicine, nursing, and pharmacy, since the new generations of health care students will need to learn how to handle drugs that are not pills or liquids in a vial, but rather are living biological medicines. The new “living medicine” preparation and delivery will be performed by large teams of experts with different expertise and backgrounds, including those with cell biology and manufacturing knowledge, in addition to experts in medicine, surgery, imaging, monitoring, outcomes, health technology, and statistical analysis.

The common passion to treat a specific disease or disorder unites these interesting multifaceted teams, and each member brings a unique perspective to the group. It is important for members of these broad and committed groups to remember to always seek evidence-based solutions for developing novel treatments that have the best chance of impacting the disorder that they hope to cure. Publication of peer-reviewed “Proof-of-Concept” data in reputable journals accelerates progress toward cures by disseminating knowledge in an evidence-based manner.

Our “sister journals,” STEM CELLS (www.StemCells.Com, @StemCellsJournal) and STEM CELLS TRANSLATIONAL MEDICINE (SCTM) (www.StemCellsTM.com, @StemCellsTM), have continued to publish important articles in the field, submitted by talented authors and research teams who are pushing forward the frontiers of cell and gene therapy, stem cell

biology, immunotherapy, and regenerative medicine. We are grateful to all of our outstanding authors who have contributed to the sister journals in 2017. I would like to specifically congratulate our authors who have contributed to the field of stem cell gene therapy [1–3] and those who have contributed to a better understanding of cancer stem cells and targeting them through immunotherapy, as detailed below.

Articles published in STEM CELLS in 2017 helped to unravel the intricacies of cancer stem cells, to better understand and target them. Advances were described in the understanding of glioblastoma [4, 5], skin cancer [6], uterine and ovarian cancer [7, 8], leukemia [9] and multiple myeloma [10], thyroid cancer [11], bone [12] breast [13, 14], and lung cancer [15], as well as liver, colon, and gastric cancer [16–20].

There was an interesting review on “the malignant hematopoietic stem cell niche” [21]. Other reports focused on different types of treatment for malignancies [22], including a review on “Emerging Drugs Targeting Epithelial Cancer Stem-Like Cells” [23] and another on “Emerging Principles from the Clinical Application of Chimeric Antigen Receptor T Cell Therapies for B Cell Malignancies” [24]. In 2017, to further aid in the understanding of targeting neoplastic cells, we published an excellent review on “how the tumor microenvironment protects cancer stem cells” [25].

Articles contributed also to a better understanding of the immune system and its development and function, potentially leading to improved knowledge on how to more successfully use cell therapy in the field of immunology [26–28]. A subset of our 2017 articles focused on immunology in the context of mesenchymal stem/stromal cells or similar cell types, either in the microenvironment or after transplantation [29–37]. Davies et al., in the LeBlanc laboratory, provided evidence that “mesenchymal stromal cell (MSC) derived soluble PD-1 ligands modulate the activation status and effector function of CD4+ T cells” [38].

Together, these articles focusing on the immune system, cancer stem cell properties,

and ways to target the cancer stem cells have helped move the field forward toward better cancer immunotherapies of the future.

In 2018, *STEM CELLS* will continue to focus primarily on the functional and mechanistic aspects of stem cell biology and the potential of different types of stem cells for therapeutic applications, and we will report key, well-controlled advances in stem cell clinical trials. Articles should have definitive conclusions and be mechanism-based to be considered for potential publication in *STEM CELLS*. Our sister journal [39] *SCTM* provides an excellent forum for translational, clinical, and technical advances for stem cell therapy development. *SCTM* primarily covers technical advances in delivering cell therapy, advances in animal models, and new findings that help advance promising stem cell therapies closer to the clinic. We truly appreciate the associate editors, staff members, and

authors who all contribute to the ability of both journals to publish the best stem cell articles.

I would also like to personally thank our outstanding reviewers, who have taken their precious time to referee articles for the journal. We rely upon their knowledge, expertise, fairness, skills, and insight to review the excellent papers submitted to us by authors worldwide. Together, we help to push the field of stem cell biology to new levels and toward safe and effective clinical application.

From the entire Editorial Board of *STEM CELLS*, we wish you a new year full of the best research and successful data and funding. We hope to see more success in translating stem cell, immunotherapy, and gene therapy advances into improved treatments for patients who need them. Happy New Year, and please continue to send us your best work in 2018!

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