Our department has experienced tremendous growth in almost every respect over the past several years. Our faculty now numbers well above 200, we provide anesthesia for more cases than at any point in our history, and our residency and fellowship programs have expanded while attracting ever more competitive applicants. I am very proud to say that the Department’s research programs have also gained in size, diversity and impact. While a decade ago we had only about $3M in NIH funding per year, we now have approximately $17M already in 2020. Funds from other federal sources, e.g. VA, PCORI, DoD, and foundations like Gates Foundation and FAER, have increased greatly as well. The portfolio of projects we pursue ranges from molecular neuroscience to traumatic brain injury, from immunology to epidemiology and from regional anesthesia to economics. All divisions are involved in research and some have national if not international reputations. It’s a lot to keep up with.

Given all that is happening with research, it seems appropriate to periodically update the department with some highlights. This newsletter is the inaugural attempt at doing just that. It is not exhaustive, and there are many other projects, awards and publications that could be mentioned, but please read on for a summary of a few of our recent challenges and accomplishments.
RESEARCH DURING A PANDEMIC

Some might claim to have known that it would happen sooner or later, but few predicted that COVID would bring research to a near-standstill in the spring of 2020. For months laboratories were running skeleton crews simply to maintain critical resources, and trial enrollments were halted altogether. Our scientific meetings were cancelled along with our annual research dinner. In what has been a halting and ungainly process, we are now back to relative productivity although serious restrictions remain on some projects, particularly volunteer clinical research.

We have attempted to pass on information to investigators as quickly as it is received from the Medical School and University. It does need to be acknowledged that such information has not always been consistent or timely, although that has improved markedly over the past few months. The official research recovery website has hopefully been bookmarked by all project leaders:

https://cardinalrecovery.stanford.edu/research/research-recovery/

As a reminder, the most basic tasks for research groups are to:

1. Register all project personnel coming to campus
2. Always use appropriate PPE
3. Complete necessary trainings
4. Complete daily health checks
5. Maintain appropriate social distancing and lab density rules
NEW RESEARCH AWARDS

Some of the best news over the past year has related to our Department’s success in winning new research awards. The following is an incomplete list of federal research awards started in 2020, but the titles of these awards illustrate the diversity of expertise we have:

R-series NIH awards
- Aghaeeepour - Machine Learning For Integrative Modeling Of The Immune System In Clinical Settings
- Clark - B Lymphocyte-Mediated Autoimmunity In Pain After Trauma
- Drover - Building A Platform For Precision Anesthesia For The Geriatric Surgical Patient
- Gaudilliere - Harnessing The Human Monocyte System To Improve Surgical Recovery
- Mackey - Prognostic biomarkers for high-impact chronic pain: Development and validation
- Mudumbai - Cancer and Mortality Associated with Long-Term Opioid Use Among the Population Using Veterans Health Administrations Services
- Tawfik - Myeloid Lineage Targeting To Improve Recovery From Injury And Surgery

K-series NIH awards
- Eagleman - Intracranial Cortical Network Connectivity Underlying Complexity Changes During Anesthetic Emergence
- Jarrahi - Multivariate Machine Learning To Characterize Opioid-Induced Alterations In The Brain In Chronic Pain

VA Merit Review awards
- Clark - Traumatic Brian Injury and Endogenous Pain Modulation
**FARM ACTIVITY**

The Fellowship in Anesthesia Research & Medicine (FARM) welcomes residents interested in pursuing careers in Academic Anesthesiology as physician-scientists with a diversity of interests. Our newest FARMer is CBY resident, Dr. Lichy Han, who completed her MD and PhD at Stanford with Dr. Russ Altman in biomedical informatics. We are also welcoming two CA1 residents from the Med-Anesthesia combined program, Dr. Christian O’Donnell and Dr. Jason Batten. Dr. O’Donnell joins us with an interest in outcomes after cardiac surgery and is working with several of our faculty including Dr. Jessica Brodt and Dr. Charles Hill. Dr. Batten is an expert in biomedical ethics and recent recipient of the Hopkins GIM Housestaff Jeremy Sugarman Award for his abstract “Variation in the Design of Do-Not-Resuscitate Orders and Other Code Status Options: A Multi-Institutional Qualitative Student”. Current CA2 FARMers include Dr. Amran Asadi and Dr. QiLiang Chen. Dr. Asadi will be taking a short leave of absence from our program to serve as a flight surgeon with SpaceX in charge of the crew health stabilization program! Dr. Chen is working with Dr. David Clark at the VA Palo Alto on the intersection of traumatic brain injury and pain. Our current CA3 FARMer is Dr. Jalal Baruni who will be joining the lab of Dr. Liqun Luo to pursue his interests in neuroscience. Overall we have an amazing group of FARMers and look forward to all that they will accomplish as they move forward in their careers!

**DEPARTMENTAL FUNDING AND SUPPORT**

The process of doing research is confusing and occasionally challenging even for the most experienced investigators. Please contact the Director of Strategic Research Hui Wang or the Vice-Chair for Research David Clark if there is some element of the research process or the Department’s programs that you do not understand.

Remember the availability of the Department’s small grants program. Applications are reviewed on a rolling basis for those awards with budgets of up to about $12K (contact Hui Wang). Please also be on the lookout for the Department’s FIDL award opportunity that is typically offered 1-2 times per year for projects with up to $100K for one year.

**FINAL NOTE**

It is very clear that the departmental website and our investigator’s websites are often the first place people go when they want to learn more about the Department’s research interests. We do accept contributions to the research webpage, and keeping your own group’s website fresh and informative is highly encouraged.

Please contact Toni Benevento (tonibene@stanford.edu) for assistance with these updates.
SELECTED ORIGINAL RESEARCH PUBLICATIONS

With so many productive research groups in the Department, we publish hundreds of papers every year, far too many to list in this brief newsletter. However, a few reports from investigators in each division in 2020 are listed below, again to help us celebrate the diversity and success of our research program.

- **VoPo leverages cellular heterogeneity for predictive modeling of single-cell data.**

- **Palliative Care and End-of-Life Outcomes Following High-risk Surgery.**

- **Barriers to Effective Transfusion Practices in Limited-Resource Settings: From Infrastructure to Cultural Beliefs.**

- **Preferential inhibition of adaptive immune system dynamics by glucocorticoids in patients after acute surgical trauma.**

- **Critical patient insights from the same-day feedback programme at Stanford Health Care.**

- **Assessment Scores of a Mock Objective Structured Clinical Examination Administered to 99 Anesthesiology Residents at 8 Institutions.**

- **Evaluation of US State-Level Variation in Hypertensive Disorders of Pregnancy.**

- **Clinical Profiles of Concurrent Cannabis Use in Chronic Pain: A CHOIR Study.**

- **Hospitalization Patterns for Inpatient Pediatric Surgery and Procedures in California: 2000-2016.**

- **Avoid or engage? Outcomes of graded exposure in youth with chronic pain using a sequential replicated single-case randomized design.**

- **Systemic Absorption of Lidocaine from Continuous Erector Spinae Plane Catheters After Congenital Cardiac Surgery: A Retrospective Study.**

- **Implementation of a patient-specific tapering protocol at discharge decreases total opioid dose prescribed for 6 weeks after elective primary spine surgery.**