DECEMBER 2016
NEWSLETTER

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2016 IN REARVIEW

At first, finding any two pieces that might fit together in a complex jigsaw puzzle is a Herculean task. Painstakingly, colors and shapes can be sorted one-by-one into groups that seem to be related. One satisfying match is then followed by another, sometimes preceded by long frustrated periods of searching yet in other moments an almost magical placement and orientation allows for instant recognition. With each piece connected, the picture becomes clearer and the pool of remaining pieces smaller. Each becomes easier to find than the last, and easier to place until at last the puzzle is complete.

So it is with understanding the biologic underpinnings of disease. At first there is a confusing mixture of molecules, interacting with each other in undecipherable pathways. Slowly the different types of molecules are identified, separated and tested to see what they interact with and how. As the function and interactions of each molecule are placed in turn, the picture of causation becomes clearer, and the work to identify the remaining molecular players becomes easier and easier.

Since the unveiling of the human genome nearly 20 years ago, progress in elucidating the underpinnings of disease has occurred at an exponential pace. Gone are the days when insights are shared in only annual gatherings or through publications which can be separated from the work to produce them by years. Instead, this is an age where insights are often shared real time over the internet. In this way, laboratories learn which pieces have been placed in near to real time and the chase to create the finalized picture is made all the more rapid. Meanwhile, technological advancements in the tools used to identify important molecular players and to tease out their exact roles is shifting the pace of discovery into entirely new gears.

And thus we find ourselves as we enter 2017, with many of the pieces in many important diseases discovered and those remaining to be placed before there are cures becoming smaller and smaller. Accordingly, our expectations for advancements in medicine over the next decade should be high. Very high. Already we see drugs targeting new molecular pathways, sometimes by making use of our growing understanding of our own body's disease-fighting functions, entering the market. The Food and Drug Administration, cognizant of the deepening of our understandings and the importance of new discoveries has created a new regulatory pathway for breakthrough therapies. Some new products have made it from conception to market in a handful of years. This timeframe contrasts starkly with the decade historical medicines have required. Therefore not only will discoveries occur more quickly, but their approval for human use as well.

The stock market has not been sitting idly by. 2012 through 2015 were years in which the biotechnology indexes tripled. In the private markets, valuations of private biotechnology companies rose correspondingly. That is until 2016, when the biotechnology index fell approximately 20%, the potential for companies to go public changed abruptly, and funding for earlier stage enterprises began to become difficult again. What happened?

While the pace of invention is historic, that does not mean it will go in a straight line, or that everyone should have the stomach for the inevitable failures along the way. During the years of

strong performance, many who lacked this perspective joined the joyful fray to participate in the gains. When the market retraced, however, they found themselves wondering if they could evaluate those companies in which they were invested, and the answer was often no. Thus, bad market performance led to worse performance by virtue of selling by those headed for the door. The party, after all, seemed over for now, particularly with a seemingly certain Clinton win on the way and all that could accompany that in regard to what was expected to be negative changes in drug pricing and reimbursement. The surprise Trump win caused a moment of reflection where prospects for biological innovators seemed brighter, followed by general confusion as campaign promises to overturn the Affordable Care Act became more muted and as bystanders waited to see what a Trump administration might actually look like.

This is all a side show in which it is easy to lose perspective. Throughout the world there are many different payment systems for new drugs. Most of them are government operated. Despite penny pinching and hurdles that have made drug launches more complex in certain countries, there are vanishing few instances where a drug that actually does something new and important receives an inadequate price. In the United States, whether you have a Hillary Clinton or a Donald Trump, this will be the case in the future. And the drugs that are to come will do important things.

What is more problematic are the disconnects between academic medicine and the commercial world. Academia is where most of the interesting new science is emanating. Yet in the academic setting, it is difficult to marshal all of the technical expertise and funding required to advance a medicine past the conceptual stages. Meanwhile, the venture industry and the pharmaceutical industry have sought to cherry pick the best academia has to offer. However, identifying the cherries is something no one has been good at, leaving behind a disappointing morass of missed opportunities, wasting assets and frustrated faculty.

We are proud this year to have announced the formation of Bridge Medicines, a bold attempt to overcome many of the barriers to translational research. This new company is a collaboration between ourselves, Takeda Pharmaceutical Company, Memorial Sloan Kettering Cancer Center, Weill Cornell Medicine and The Rockefeller University, along with Bay City Capital. Through this entity, the intellectual property from prominent academic institutions is moved forward through pharmaceutical technical expertise, and combined with funding and the ability to create new enterprises. In this manner, the barriers between a discovery and the ability to find the drug we need in our medicine cabinets, are removed.

We hope Bridge will not be just one piece of the puzzle, but rather a catalyst for bringing many pieces in the beautifully complex puzzle placed, oriented, and connected. Please keep reading to learn what makes Bridge so unique, and why it is an important new venture for advancing healthcare.

- by James E. Flynn

TRAVELING A NEW PATH FOR INNOVATION WITH BRIDGE MEDICINES

In October 2016, Deerfield, along with esteemed partners Memorial Sloan Kettering Cancer Center, The Rockefeller University, Weill Cornell Medicine, Takeda Pharmaceuticals, and Bay City Capital together launched Bridge Medicines, a new company that will advance healthcare by transitioning academic research projects into IND-ready drug candidates.

The model for Bridge is like no other. It builds upon the existing Tri-Institutional Therapeutics Discovery Institute (Tri-I TDI) from the aforementioned academic institutions, which pools early-stage drug discovery projects among the three members and helps facilitate required pre-clinical work to validate those projects. Now, Tri-I TDI projects can graduate to Bridge, which is responsible for their clinical development.

Drug development has evolved from a drug in search of a disease to instead a disease in search of the right targeted therapy, where even pre-clinical studies can have implications for ultimate commercial viability and success. Accordingly, a challenge for Tri-I TDI has been how to take their potential drug candidates and put them through the full range of IND-enabling and proof-of-concept studies. Complexities include the determination of what studies are necessary, which can vary according to molecule and therapeutic area(s), financially supporting those studies, and creating the right infrastructure around that when appropriate.

Deerfield, through its deep bench of investment professionals and Institute experts, has the ability to address Tri-I TDI's concerns and to determine the correct studies necessary, as well

as the desire and incentive to help manage that development process over a longer timeline to see Bridge projects through to successful outcomes. Often this kind of expertise is either completely absent for nascent projects, or comes in the form of a one-time competitive assessment that can quickly become stale in a rapidly changing field of medicine. In 2017, we hope to see four candidates graduate from Tri-I TDI to Bridge, and for that number to grow in future years.

There is no "typical term sheet" at Deerfield, and this is embodied by Bridge. Importantly, all partners have equity ownership of Bridge, and also have shared economic interests in future spin-out companies, royalty payments, or fully-licensed programs – and not simply a licensing fee from academic institution to industry player as is often the case. Often venture deals, particularly those which are very early stage, are simply cherry-picked for those which most easily lend themselves to traditional financing models and paradigms, which can leave non-traditional but highly innovative programs and ideas without sufficient support.

Another important aspect of Bridge for Deerfield is its significance to the New York life science ecosystem. New York boasts a concentration of government funded researchers, Nobel prize winners, and Howard Hughes Medical Institute investigators in the New York area, and yet lacks the corresponding evidence of new company creation that could be expected. While we have been cognizant for some time that early stage research has a frustratingly difficult time getting adequately funded and supported, a more recent mandate for some of Deerfield's funds to support venture investing brought the timeline for Deerfield to bring a partnership like Bridge to life into sharper relief. Our work with Bridge also dovetails with Deerfield's efforts to support entrepreneurship. As a partner in NYC Mayor Bill de Blasio's recent announcement of the LifeSci NYC initiative, a 10 year commitment to supporting and growing biotech in NYC, Deerfield will support paid internships and life science training curricula. We additionally intend to seek to bring to the area biopharmaceutical leadership, enable the build out of wet labs and incubation space, among other essential components to the success of life science in the city.

- by Christine Livoti

PEER-REVIEWED ABSTRACTS

As part of Deerfield's mission of advancing healthcare, the Deerfield Institute is committed to publishing its proprietary research in peer-reviewed, open access scientific journals. Below is a selection of some of our recently published work. More information on the Deerfield Institute, and copies of certain past publications are available on the web at Deerfield.com/Institute.

PATIENT PREFERENCE AND ADHERENCE – DOVE PRESS

COMMUNICATION PRACTICES AND AWARENESS OF RESOURCES FOR ACROMEGALY PATIENTS AMONG ENDOCRINOLOGISTS

SUSAN POLANCO-BRICENO, DANIEL GLASS, CINDY PLUNKETT

Abstract

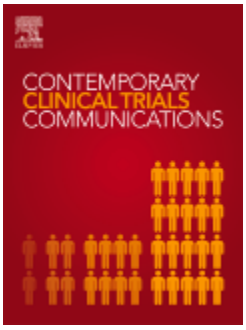
Purpose: This study was designed to assess the awareness and utilization of resources to improve patients' treatment experiences among endocrinologists who currently treat patients with acromegaly.

Methods: A total of 4,280 US endocrinologists were randomly selected from the CMS National Plan and Provider Enumeration System and were invited by mail to participate in a 20-minute online survey. In order to qualify, respondents had to be the primary physician making treatment decisions for at least one patient for their acromegaly.

Results: Results are based on responses from 126 physicians from primarily urban and suburban practices, with a median of five acromegaly patients. A total of 70% of patients are currently receiving drug therapy; among these, 91% are on octreotide (51%), lanreotide (29%), or pasireotide (11%), alone or in combination with another therapy. Nearly half of the respondents thought that the impact of patient adherence on therapy outcome for acromegaly was either not very (40%) or not at all (7%) significant. Respondents who believe patient adherence significantly impacts treatment outcome were significantly more likely to discuss automated adherence reminders (50% vs 26%; P=0.015), mobile administration programs (57% vs 35%; P=0.029), and symptom tracking (72% vs 42%; P=0.002). Overall, 44% of respondents routinely recommend education/emotional support programs, and 25% routinely recommend financial assistance programs. Respondents who believe patient adherence significantly impacts treatment outcome generally were more familiar with individual education and emotional support programs compared to those who do not, although they were not more likely to routinely refer patients to any of these resources.

Conclusion: There are unmet needs with respect to increasing awareness among physicians of the importance of patient adherence to therapy, resources available to patients, and how collaboration among patients, nurses, and physicians can improve adherence and overall treatment experiences.

CONTEMPORARY CLINICAL TRIALS COMMUNICATIONS



PRESS RELEASES FOR PHASE 2 CLINICAL TRIAL TOPLINE RESULTS: HAVE THE OBJECTIVE PRE-SPECIFIED EFFICACY RESULTS BEEN DISCLOSED?

ZHENG SU, CHRISTINE LIVOTI

Phase 2 clinical trials are of vital importance in the drug development process as they usually gather preliminary evidence of efficacy of potentially new therapies and support the go/no-go decision for Phase 3 pivotal trials. Topline results of Phase 2 trials are typically first disclosed through press releases so that key stakeholders (patients and their advocacy groups, physicians, clinical trials practitioners, investors, etc.) can have timely access to a high level summary of the important findings. The sponsors of the trials often will save more detailed findings for future medical conference presentations and/or peer-reviewed journal publications, and as a result there may be an extended period of time where only the topline results are available on which stakeholders can rely. It is therefore critical for trial sponsors to release objective findings and avoid selective disclosure of favorable results.

BIOTECH BLOG

A BRIEF PATENT PRIMER

MARK D. SHTILERMAN AND JOSEPH ENG JR.

Science and engineering graduate students usually do not learn about patents and the patenting process during their formal coursework. However, even as a junior researcher it is possible to create patentable intellectual property that could eventually be the subject of lucrative patent licenses. This article discusses some fundamental aspects of patents and the patenting process to provide a brief introduction for scientists and engineers.

IP CORNER

Intellectual Property (IP) is a vital asset to any emerging company in the healthcare space. Here, we highlight noteworthy trends and events in the IP realm with implications for both young and established healthcare companies alike.

DO PRIOR SECRET SALES INVALIDATE PATENTS?

The *quid pro quo* of the U.S. patent law is that the inventor is awarded commercial exclusivity for a limited period of time in exchange for public disclosure. However, once knowledge enters the public domain it cannot be recalled; thus public disclosure before a certain date (called "critical date") precludes subsequent attempts to obtain patent protection. If it is discovered that a sale or an offer for sale of a product covered by a later filed patent occurred prior to the critical date for the filing of the patent, the patent is invalidated. This is because a commercial sale made prior to the critical date is viewed as an unfair extension of the period of exclusivity granted by the patent. An issue arises when a sale or an offer of sale is first made privately followed by a later patent filing. In the pharmaceutical industry, such sales are sometimes made between a small business innovator and its contract supply manufacturers or research organizations because the small business lacks the necessary resources to manufacture the product and conduct clinical trials by themselves. These sales often precede patent filing because in the early stages of development, companies often don't realize the commercial value of what they have. The law was aimed at large companies that have an internalized supply chain, but disadvantages small companies that rely on external suppliers to help conduct their research and development.

Historically, the courts have interpreted the patent statute in a way that even secret sales disqualified subsequently filed patents. The America Invents Act (AIA) that applies to patents filed on or after March 16, 2013 may have changed this law. Under the current widespread interpretation of the AIA law, only public sales will render later-filed patents unenforceable. However, there is still a lot of uncertainty in that interpretation, but a pair of cases that are now percolating through the courts should provide much needed clarity to the pharmaceutical industry.

October 12, 2016, Merck asked the Supreme Court to review the decision of the Court of Appeal for the Federal Circuit that even a secret offer of sale invalidates later filed patents. *Merck & Cie, et al. v. Watson Laboratories, Inc.*, No. 16-493. (Sup. Ct.). In this case, Merck and Weider Nutrition negotiated sale terms for 2 kg of a drug for evaluation purposes. The relevant patent was filed before the AIA law kicked in. The Federal Circuit applied "traditional contract law" and found that "[Merck's] detailed fax -- providing essential price, delivery, and payment terms -- contained all the required elements to qualify as a commercial offer for sale" that invalidated Merck's later filed patent. On January 9th, 2017 the Supreme Court declined to review this case.

Another interpretation of the "on sale bar" is the issue in *Helsinn Healthcare SA et al. v. Teva Pharmaceuticals USA Inc. et al.*, which was decided in the U.S. District Court for the District of New Jersey in 2016. In this case, the judge held that Helsinn's licensing and supply agreement did not qualify as a patent-invalidating sale. "The new requirement that the on-sale bar apply to public sales comports with the plain language meaning of the amended section, the USPTO's interpretation of the amendment, the AIA Committee Report, and Congress' overarching goal to modernize and streamline the U.S. patent system." "The post-AIA on-sale bar inquiry . . . requires that the sale make the claimed invention available to the public . . ." In this case, the patent was filed after the AIA took effect. Teva is currently appealing the decision to the Court of Appeal for the Federal Circuit. The decision is expected to eventually be appealed to the Supreme Court.

The ability to use outside contract manufacturing and research organizations without losing patent exclusivity is critical to small pharmaceutical and biotechnology companies. There is hope in the pharmaceutical and biotech patent communities that "on sale bar" will not apply to secret sales that occurred after the AIA. The uncertainty remains, and the investment community has to pay close attention to the contract dates in relation to patent filing dates when evaluating potential investments. The upcoming *Helsinn* case should some provide much-needed clarity.

- by Mark Shtilerman

CAUGHT OUR EYE

A team of researchers from Oregon Health and Science University recently examined the practice of FDA employees leaving the agency to subsequently take private-sector jobs within the pharmaceutical industry. Describing this "revolving door" practice, the authors found that nearly 60% of medical reviewers who left the agency went on to either work for, or consult with, the pharmaceutical industry. *Vox*

One perhaps unlikely stakeholder caught in the crossfire of the recent uproar of US drug prices is patient advocacy groups. Many big budget groups have stayed on the sidelines through the recent debate, leaving some critics to point fingers at these organizations for failing to perform there patient advocacy responsibility by not fighting for cheaper drug prices from the very companies that are often financial supporters of those same organizations. While some organizations have spoken out, these are perceived as being in the minority. *The New York Times*

Partnerships between ride-hailing services such as Uber and Lyft and hospitals are emerging to make it easier for patients to get access to care. Previously published data found that 10 to 51 percent of patients reported lack of transportation as a barrier to care. While patient costs for these services may vary, transportation for non-emergency visits are covered for Medicaid patients, with the extent of reimbursement varying according to state rules. Some private Medicare Advantage plants may offer some benefits, thought traditional Medicare does not cover non-emergency medical transportation. *Kaiser Health News*

Ahead of the latest open enrollment season for Obamacare healthcare exchange plans, the outgoing administration has made a push to attract young adults to sign up for insurance. The use of digital messages and social networks is hoped to bring in more adults age 35 and under, who, importantly, help offset costs of older and generally sicker people on exchange plans. *The Wall Street Journal*

Managed care provider Aetna has said that it will offer some customers and employees discounts on the Apple Watch. Aetna will develop apps for the devices designed to help consumers remembers to take their medications, refill prescriptions, or contact a doctor. The deal is hoped to be a boon for Apple as well, as the device's sales have paled in comparison to the iPhone. *Bloomberg*

A recent editorial in *Nature* advocates for non-academic career paths for young researchers to be praised, rather than seen as "failures" or a compromise. The imbalance of PhD students and senior posts seemingly would make it impossible for all young trained scientists to pursue purely academic careers. They point to a recent report that surveyed former full-time academic researchers from across Europe who left to pursue other careers, with more than four in five being satisfied in their new jobs. Many stayed connected to science, with roles in administration, outreach, or teaching. *Nature*

In an effort to get better insight into patient health, doctors and hospitals are on the hunt for additional behavioral and consumer data on its patients. One such example is an algorithm designed to predict which hospital patients would come back less than a month after leaving, incorporating a history of ailments, prescriptions, lab tests, vital signs, and other medical care. In its first nine months, the predictive tool cut readmissions for high-risk patients by 20% for the provider who designed it. They plan to incorporate additional consumer data from a company that mines purchasing and demographic information to improve the algorithm. *The Wall Street Journal*

CMS has decided to drop its planned Medicare Part B Drug Payment Model, first unveiled in March this year. The agency noted that a number of stakeholders addressed concerns about the model, with the complexity of the issues raised unworkable in the limited time available before the plan was set to be finalized. More than 1300 comments had been submitted to the proposal, with pharmaceutical companies coming out as vocal advocates against the plan. *Regulatory Affairs Professionals Society*

Sequencing giant Illumina has announced its participation in iHope, a program aimed at children with undiagnosed rare diseases who cannot afford whole genome diagnostic sequencing. iHope is a collaboration between Illumina, the Foundation for Children of the Californias, the Rare Genomics Institute, and the University of California, San Francisco Benioff Children's Hospital, who will provide the services at no cost. *GenomeWeb*

DEERFIELD FOUNDATION

The Foundation has formed 33 partnerships and has invested over $25 million for the advancement of children's health in its ten years. It has supported impactful work from health clinics in Nepal to a mobile medical home for children in the South Bronx. In this newsletter we would like to highlight just one of the organizations that we feel is helping us fulfill our mission of advancing healthcare.

We are proud to be critical supporters of Last Mile Health.

LAST MILE HEALTH

Mission:	Last Mile Health (LMH) seeks to save the lives of women and children in Liberia's most remote villages by improving community healthcare and removing critical barriers to healthcare access.
Partner since:	2014
Description:	Since 2007 LMH has pioneered a model Community Health Worker (CHW) system that is redefining rural healthcare delivery, deploying thousands of community health workers in Liberia in partnership with the Liberian Ministry of Health and Social Welfare. LMH transforms local health workers into medical professionals that fight diseases such as diarrhea, pneumonia, malaria - the three highest risks to children in rural Liberia - and provide maternal care. CHWs deliver basic care and target over 75% of the disease burden that kills rural women and children.
Total Funding:	$225,000
The Deerfield Perspective:	Recognizing the need to rebuild Liberia's health system following the Ebola crisis in 2014, Liberia's Ministry of Health (MOH) led a process of defining its priorities to achieve a dramatically improved health system. With consultation across the health sector, Liberia's MOH established Liberia's Investment Plan to Build a Resilient Health System that would take effect between 2015 and 2021. The Investment Plan's objective to build a fit-for-purpose, productive and motivated health workforce set in motion a process that led to the creation of Liberia's National Community Health Assistant Program (NCHA) in 2015. With unprecedented political support from President Ellen Johnson Sirleaf and her Cabinet, all of whom recently voted to validate the NCHA Policy, the program is slated to launch in 2016. In recognition of eight years of government partnership and significant expertise in community health service delivery and CHW programming, the Liberia MOH selected LMH as its lead national technical partner for this landmark program. In this critical role, LMH will support the Government of Liberia and its partners over the coming two years and beyond to coordinate the training and deployment of approximately 4,100 Community Health Assistants and 230 Supervisors who will extend lifesaving care to every community that lies beyond the reach of the public health system.
Last Mile Health Perspective:	"There is such an exciting movement given this window of opportunity – and Deerfield's / our focus on saving children's lives is becoming a major focus nationally in Liberia as the key first intervention to be delivered by Community Health Workers." Rajesh Panjabi, MD, MPH – Chief Executive Officer
Most Recent Project Funded:	In July of 2016, Deerfield made a one year $100,000 commitment to support a combined effort between LMH and the Government of Liberia to bring a CHW to every remote community in Liberia; specifically, to pay for a minimum of 250 additional CHWs in one new county of Liberia and to increase those CHWs ability to identify and manage illness in 8,640 children under the age of five.

LAST MILE HEALTH

MEET THE FELLOWS

Beginning in 2015, Deerfield started the Deerfield Fellows program, designed to attract students with interest in pursuing healthcare or finance fields from local NYC-area colleges and universities from diverse backgrounds for an immersive summer internship program. Successful summer interns are invited to stay through a yearlong Deerfield Fellowship program, with the most successful of those graduating to become Associates at Deerfield. We are extremely proud of the work our Associates do, and here will highlight an Associate in each issue.

MEET WENXI CHEN:

WHAT INITIALLY DREW YOU TO THE FELLOWS PROGRAM?

As I searched for wealth management internships towards the end of my junior year, I was drawn to the Deerfield Fellows program because it offered the most exclusive resources and valuable learning opportunities. The Fellows program promised training in all aspects of Deerfield's operations such as compliance, trading, financial modeling, financial analysis, data analysis, accounting, and advanced lectures on biotechnology. Additionally, as a Finance student, I was impressed and excited by Deerfield's success and endurance to survive two financial crises: the dot-com bubble of 1999 and the housing bubble of 2008. I believe Deerfield's robust strategy and ability to manage risk have allowed it to stand the test of time.

WHAT IN YOUR EXPERIENCE HAS MATCHED YOUR EXPECTATIONS ABOUT BEING A DEERFIELD FELLOW AND NOW ASSOCIATE?

Through the weekly case studies and the work I did as a Fellow and will continue to do as an Associate, I have learned about behavioral finance and sharpened my analytical and critical thinking skills. I witnessed anchor bias when asked to price an asset, and recognized confirmation bias when studying questionnaires made to confirm a favorable belief instead of challenging the underlying assumption. The awareness of such biases present in all people, including myself, has enabled me to be more prudent when establishing the parameters in my own models, and helps me to conduct research that draws more accurate results.

DESCRIBE A TIME OR TIMES YOU FOUND TO BE UNEXPECTED IN YOUR EXPERIENCE AS A FELLOW? AS AN ASSOCIATE?

As I started as an Associate, I quickly learned the fact that even a good idea may be hard to execute in practice, and in order to carry it out I have to solve the problem creatively. For example, when vetting a database, so that our team can have an overview of previous deals, I was confronted with the fact that there was no record of certain financial components for a market of interest, thus, the distribution of the deal size could not be determined in a straightforward manner. To solve this issue, I looked for other factors that could be translated to the market size. The utilization of this strategy gave me initial results, which once refined based on the analyst's recommendation provided me with synthetic deal sizes for the targeted market. This experience was an unexpected challenge but was also an important opportunity to learn.

DESCRIBE YOUR MOST MEMORABLE EXPERIENCE SO FAR AT DEERFIELD.

While working in the Secondary Data team alongside two of Deerfield's senior data analysts, we had a project about drug pricing inflation and no one could figure out how one of the industry reports got its data. One of the senior analysts put forward a challenge to see who could solve the problem first. And I did! Accomplishments like this make my work full of joy, because I got to help my teammates with something substantial.

WHAT ADVICE WOULD YOU GIVE TO FUTURE FELLOWS?

Hi new Fellows. In the beginning of your morning meeting experience, it will probably be more about watching than actually understanding what the analysts are talking about. But keep track of the participants' most frequently asked questions. Additionally, be aware that you are very lucky to have a knowledgeable and caring Director who dedicates his time for you. Ask questions.

WHEN NOT AT DEERFIELD, I CAN BE FOUND:

Running, hiking, reading, cooking and spending time with my boyfriend (Orey). I have to admit that I volunteer much less than when I was in college. However, the Deerfield Foundation provides the great opportunity of working with Coalition for the Homeless, in which I enjoy participating and Orey has agreed to join me the next time.

ONE FUN FACT ABOUT YOU!

Besides dog videos, I like watching YouTube videos about mathematical paradox.

For instance (this is a fallacy), let 1-1+1-1+1-1+1-1+... =①

①= (1-1) + (1-1) + (1-1) +...=0+0+0+...=0;

AND

①=1- (1-1) - (1-1) - (1-1)-...=1-0-0-...=1;

Thus,

0=1.

Or a fancier one (this is just deceptive):

$$\sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{1+5\sqrt{1+6\sqrt{1+\cdots}}}}}}=3;$$

AND

$$\sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{1+5\sqrt{1+6\sqrt{1+\cdots}}}}}}=4;$$

Thus,

3=4.

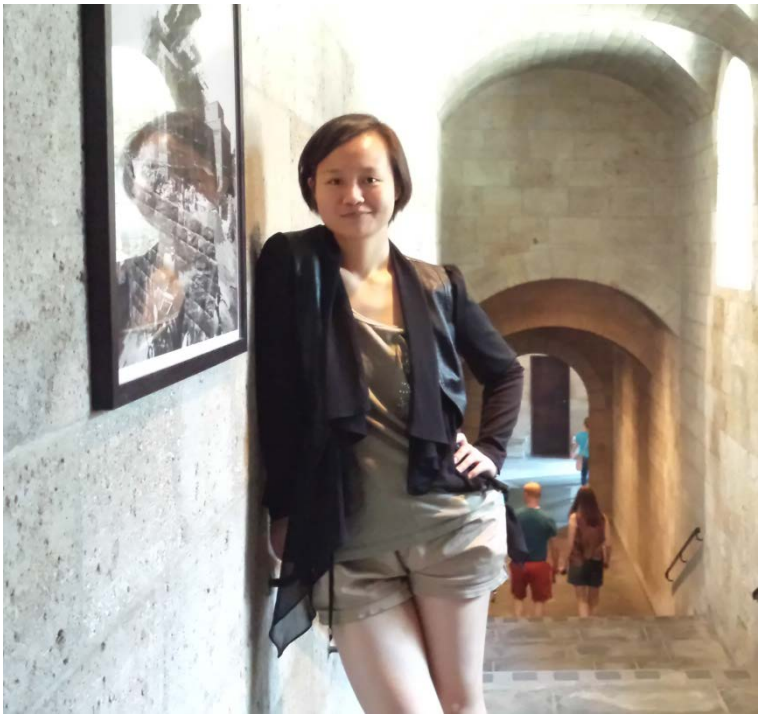


Photo courtesy of Wenxi Chen

GET TO KNOW SOME DEERFIELD'ERS

In November, one of our Deerfield'ers, Zheng Su, completed his first ever New York City Marathon. Far from a long time runner, Zheng ran his first ever 5k race in the summer of 2015 when Deerfield participated in the annual JP Morgan Chase Corporate Challenge in Central Park. Not entirely sure he could even run a full 5k when he signed up, he finished the race in 28:46 (a very respectable 9:16 pace for those keeping track at home). Zheng was quickly hooked, and ever since can regularly be found logging miles on the treadmill or running races in Central Park or Hoboken on most weekends. Zheng estimates he has run in 32 races since his first race about a year and a half ago, and already has his eyes set on the 2017 NYC Marathon, where he hopes to improve on his 2016 time of 4:36:51. His favorite part of this year's race was yelling "you were wrong" to his wife in the crowd near the finish line for saying that he had 0% chance of finishing the race.

Some of Zheng's 2016 race bibs

Photos courtesy of Zheng Su

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