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Cover story

What do we do next?

In this issue of JCR, we have a genuine and heartfelt account of a cancer survivor's journey [1]. We have a window into a patient's experience from that unforgettable moment when the diagnosis is made through to the many treatment modalities and experiences that she endures. “What do we do next?” This is what Lora Kelly asked herself, instead of “why me?”, when she was told that she had pancreatic cancer in 2013. Five years later, with grueling radiation treatments, chemotherapy with serious side effects, and difficult vaccine treatments behind her, she was told that she had stage 4 pancreatic cancer. The description of her experience and the psychological toll that cancer can take on a patient and their family is sobering. Even in the most devastating situation she was committed to a complete cure and to “living fully and bravely”. What made this possible? It is Lora's exceptional courage, positivity, and determination to fight and live, which stemmed from her clear understanding of the meaning of her suffering [2]. Her survival would save the pain of her loved ones.

What should be the meaning of drug delivery scientists' research? What inspires our research? What drives us to design that next experiment in the development of a new technology or scientific approach? Is it a patient we have met or an unmet medical need that we have learned of or is it more generally, a genuine desire to have a positive impact on society? As researchers we are faced with an intense pressure to publish, and not just publish but publish in the highest quality journals in our field [3]. Publications are paramount to the scientific enterprise. They serve as a reflection of our productivity and intellectual ability and are often the basis for career advancement and recognition. Yet, there is growing concern that this ‘publish or perish’ mentality is putting the integrity of our science at risk [3,4]. Moreover, the aim to secure a publication in a high impact journal can lead to an overfocus on the pursuit of highly novel research. In our field, this has manifested itself in an increasing number of reports of complex drug delivery formulations which have little to no potential for translation to the clinic [5]. This focus on novelty can undermine the development of simple formulations with a strong likelihood of resulting in meaningful improvements in patient outcomes.

Lora's story is a clear reminder of the extraordinary impact that our research can have on patients and their families. It is a call to action to ensure our research is motivated by what truly matters. This is not novelty and impact factors, it is the patient, their family, good science and a life-changing treatment. What can drug delivery scientists do for those who have been told they have less than 12 months to live? We need to improve therapies and treatments for the many cancer patients, as Lora said at the annual Controlled Release Society meeting in 2018 in New York. Cancer patients need real treatments, not just potential. Finding better treatments requires testing of diverse ideas and unconventional approaches. Advances are made by adapting and improving what works, and learning from those that do not work. The key to this seemingly obvious process is the strength, confidence, and willingness to accept failure. Unless we embrace failure as a learning experience, progress will not be made.

Obtaining the first ever image of an invisible black hole was made possible by a new algorithm developed by graduate student, Katie Bouman, [6] who was not bound to conventional wisdom. If a young scientist with a fresh mind can make an invisible black hole visible, a young drug delivery scientist with untethered ideas can also make invincible cancer vincible. The metrics of success or progress in our field should be based on whether a drug delivery system has saved cancer patients, not on the potential to cure or the number of publications [7]. We should never lower the goal or adjust the objective [8]. We should stop patting each other on the back, and should be more critical of each other with an expectation of real progress that will make clinical impact. Let's make Lora and all of the courageous cancer patients fighting daily to survive proud of what we do.

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The Cancer Survivor's Journey

- **1** vitamin to **17** daily pills
- **1** MRI
- **2** PET Scans
- **12** Neulasta Injections - long bone pain
- **12** Atropine injections - disabled speech
- **>19** hospitalisations for chemo s/e
- **28+** CT scans with radioactive dye
- **31** trips to the ER
- **72** experimental pancreatic vaccines
- **62** chemotherapy infusions
- **$100,000** spent in medical bills
- **>84** trips to Hopkins - 75% in snowstorms
- **>90** bags of fluid
- **>133** days and **70** nights in a hospital
- **>230** doctors' appointments
- **225** minutes of high dose radiation
- **360** lovenox injections
- **420** Lab draws

COVER STORY

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