

## The moving target that is human ARTs

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Strange how, sometimes, the confluence of concepts and technology meet in the most unusual of places and at the most unexpected of times. Such spatial and temporal alignment, if you will, guides the scientist of a reductionist ilk down the path of discovery toward the new base of ignorance that is the necessary result of the journey. This, however, prompts the next set of experiments, and so on, and so on. Sustaining this chain reaction is founded in at least one of several motives: For example, obtaining an understanding of complex biological processes or diseases for more than a sense of satisfying curiosity is a laudable driving force for many. For others, paramount is having available a technology platform upon which to collect data that support or detract from the hypothesis testing at hand. Of course, the most meritorious desirable goal is to achieve prevention or management of disease states, to the benefit of patients who, in the end, experience an improved quality of life. This pathway of conceptualizing *de novo*, satisfying the rigors of hypothesis-testing, and the ultimate translation of discoveries into real-life matters was elegantly developed by David Scadden, in the plenary lecture he delivered on Monday, at the recent ASRM annual meeting in Orlando.

His theme was articulated through a chronological series of examples tracing the evolution of stem-cell biology and regenerative medicine, from the introduction of bone-marrow transplantation to what will be happening in the near-and distant-future. Fundamental ground-breaking concepts he noted were often the subject of great skepticism and even denouncement, especially as viewed from the heights of the

academic towers dotting the landscape that is “higher education.” But persistence, determination, and a touch of serendipity not only brought these ideas to fruition—opening the doorway to true translational medicine—but often resulted in recognizing these scientists and medical specialists with the Nobel prize. Sound familiar?

As I have previously discussed in this column, the case of Bob Edwards stands as an illustrious example of Dr. Scadden’s lecture. It poses illustrates? then, as he discussed, the role that reproductive medicine in general, and human ARTs in particular, has played in this and other domains of regenerative medicine. By the end of the ASRM meeting, this year, it was patently obvious that the field of reproductive medicine has become a fast-moving target; one that we should mindfully process, in light of Scadden’s message.

Consider that only one week before this lecture was delivered, two extraordinary publications appeared in *Nature*, announcing fundamental breakthroughs in regenerative medicine, based on the application of human ART core principles and practices. In one case we have the demonstration of patient-specific stem-cell derivation from donated human oocytes that were subjected to the “Dollyesque” protocol of somatic-cell nuclear transfer—so-called SCNT. In a companion paper, left over/donated human zygotes were reconstructed, after mitotic spindle removal, to elaborate further upon the transcriptional driving forces for early human development, which—not surprisingly—were far less permissive for chromatin remodeling in *Homo sapiens* than in *Mus musculus* (DOI:10.1038/ncomms1503). The trilogy of discovery, hypothesis-testing, and translation would seem nearly complete, were the glass half-full. Maybe...

One inescapable conclusion, based on this work, is the pronouncement of a formal linkage between the practice of reproductive medicine to the expanding world of human

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regenerative medicine. A more than cursory sojourn through the ASRM meeting sessions concretizes this notion. Dr. Scadden's lecture filled the auditorium to capacity at the intellectual dawning of this year's meeting. This was followed by coverage of topics not infrequently represented in the pages of JARG: PGS; oocyte cryopreservation; molecular roadmaps for male infertility; stem cells, and regenerative medicine (interestingly, several sessions of the latter occupied Wednesday afternoon's closing time-frame). As the boundaries between disciplines of basic and applied science become blurred even further, and the calling for a basic research enterprise acknowledging the translational medicine imperative imposed by governmental and industrial funding sources grows stronger, changes in the attitudes of scientists and clinicians, alike, are bound to occur. Will the logic behind discovery, empiricism, and application also require refinement

and/or adjustments? Perhaps, so this issue of JARG draws further attention to the challenges that lie ahead.

We are privileged to cover the Second International Meeting of the International Society for Fertility Preservation (ISFP), to be held in December of 2011 in Miami, Florida. This fast-growing discipline in reproductive medicine has reached well beyond the purview of fertility management in cancer patients, and invites the participation of many in the field of human ARTs, as novel technologies and approaches are born in a search for a deeper understanding of the underpinnings of human reproduction. In addition to incorporating the program and abstracts for this meeting, we plan a comprehensive future issue of JARG that will summarize and interpret for our readership the latest advances in human ARTs that are emerging from this field. Enjoy.