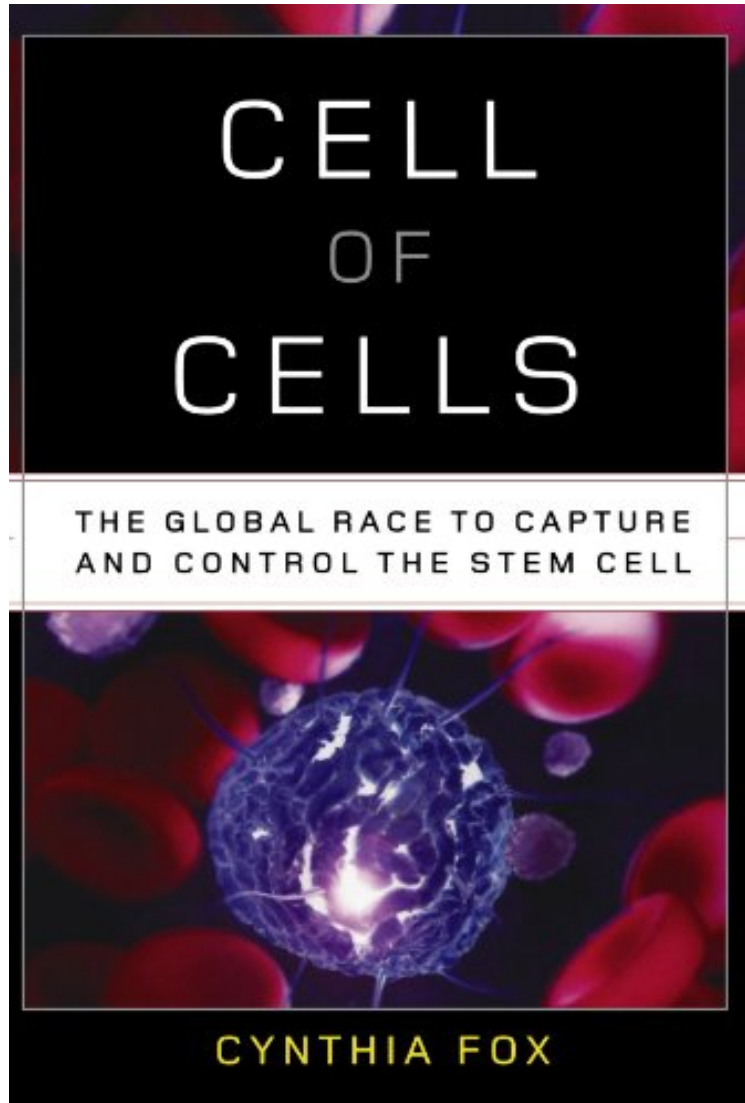


[Free] Cell of Cells: The Global Race to Capture and Control the Stem Cell

Cell of Cells: The Global Race to Capture and Control the Stem Cell

Cynthia Fox

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Cynthia Fox : Cell of Cells: The Global Race to Capture and Control the Stem Cell before purchasing it in order to gage whether or not it would be worth my time, and all praised Cell of Cells: The Global Race to Capture and Control the Stem Cell:

0 of 0 people found the following review helpful. All in a good way. Just amazing info told in a way ...By J HopkinsI cannot say enough about this book, in a few short sentences. One of my top 5 life changing books. Yes, it's incredibly detailed, yes it's packed with information, yes it sometimes gets a bit cumbersome. But. All in a good way. Just amazing info told in a way that makes you wonder why we don't see this stuff on the evening news.Thank you Cynthia

Fox for the amazing road through an area that has forever changed how I look at life. 7 of 7 people found the following review helpful. An exciting book on stem cells By Joey L. A tell tale book recounting the most recent advances in stem cell treatments, focusing on advances that have been in translational research in the last 5 years. Stem cell biology, arguably only a few decades old, has been gaining more steam in the research and clinical communities, with good reason. Much of the regenerative capabilities of both adult and embryonic (and more recently induced Pluripotent, or iPS) stem cells has allowed for new treatments for neurodegenerative disease, post cardiac arrest damage, and other diseases in which replenished cells are necessary. Cynthia Fox does a great job in taking the reader through the major centers of embryonic stem cell research (Egypt, Israel, South Korea, China, and a little in the United States) as well as those labs and clinics involved in adult stem cell therapies. In what is both an in depth look at the researchers AND the patients lives, along with the science taking place, the reader takes away the real sense of what can be done and is being done through stem cell research and therapies. 2 of 2 people found the following review helpful. Cell of Cells By Summer Favorite I am the co-founder of the Stem Cell Pioneers forum ([...]) and therefore have an avid interest in reading all I can about stem cells, the Holy Grail, of medicine. The book is a difficult read at times, but I am learning a lot from it and thoroughly enjoying it. Stem cell research is moving along at such a fast clip, that I hope Ms. Fox will write a sequel which might include more information on the patient side of the story and how many of us are pioneering treatments, fighting corruption at the FDA and working hard for legalization for treatment with our own stem cells in the U.S. via a group called ASCTA ([...]) Ms. Fox has such a knowledge of the global race for the capture and control of the stem cell that she totally held me captive for each and every chapter. Well done, Ms. Fox!

Positioned at the cutting edge of science, Cell of Cells charts the international race to utilize the stem cell. From a lab in the Sahara, where one problem is sand in the petri dishes, to an Israeli lab that narrowly escapes a terrorist bomb, stem cells have gone global. Not only are the cells studied in an escalating number of labs and lands but they are already being used. In Japan, a respected doctor uses the cells to make small women better endowed. In Connecticut, stem cell technology has created cloned cows that roam the hills displaying eerily identical personalities. In Texas, stem cells rejuvenate dying hearts. In China, clinics offer stem cells to patients suffering from everything from paralysis to brain trauma. In elegant, cogent prose, science journalist Cynthia Fox has illuminated the reality and promise of stem cell therapies. Cell of Cells illustrates how the extensive, fervent experimentation currently under way is causing a revolution, both in the body and in the international body politic.

"Ms. Fox delves deeply into the science.... (With) fully fleshed-out characters... `Cell of Cells' is an essential handicapper's guide." -- The Dallas Morning News, April 1, 2007 "Cynthia Fox is an award-winning science writer whose work has appeared in a variety of high-profile populist publications. Her new book on human embryonic stem (hES) cells is a fascinating and accessible work.... The book contains a myriad of fascinating and disturbing tales. The reader cannot but be overwhelmed by the awesomeness of the discoveries which are in the process constantly now of coming to light. This early part of the 21st century is a remarkable time. Many of the components of stem cell research, though, are not so edifying. Fox chronicles frightening examples of greed, unethical conduct and utter indifference to ethical proprieties. Apart from anything else, stem cell research is big business, huge business. Fox has done a fine job in documenting the early and inglorious years of stem cell research. She has rendered an important service in making much that is inaccessible understanding and engaging. The challenge now is for science, medicine and law to cooperate in ways which are meaningful and effective to curb the excesses of avarice and ambition in relation to stem cell developments. Fox's Cell of Cells should be compulsory reading for anyone wanting to understand where stem cell research has come from, where it is likely to head and the kinds of dilemmas that it will pose for the human race." -- Journal of Law and Medicine, 15: 161 (2007) "This work beautifully paints a picture of the global landscape of stem cell research, focused on the last five years. The first half of the book, as well as several later chapters, introduces individuals and institutes that are leaders in these research efforts; as examples, the reader is transported to Egypt, Israel, Singapore, and South Korea, as well as Connecticut and California. The author skillfully makes these characters and places come alive, such that the reader is reminded that science is done by real people with distinct personalities and in locales as unique as their principal actors. The text also contains several narrative chapters that focus more on the clinical use of stem cells: in relation to cancer; in the treatment of disorders of the cardiovascular, immune, and nervous systems; in connection to reproduction, and more... this would be an excellent book to introduce young scientists to how "science is done" in countries around the globe and to raise awareness of the globalization of science for all of us. Highly Recommended, College, Teaching Professional, General Audience." -- Amy Hark -- CLCD (Science Books and Films, Vol. 43 #2) One of the most striking narratives in the book concerns Woo Suk Hwang, the South Korean researcher who racked up a seemingly impressive series of coups--including a claim to have cloned several new human embryonic stem cell lines--before his career collapsed in 2005 in what Fox dubs "the biggest act of fraud in science history." Charges of fudged results, not to mention paying for eggs from his own female researchers, dealt a crushing setback to South Korea's stem cell efforts. Hwang's story illustrates the high stakes and pressures that mark this ongoing saga. Cell of Cells deftly chronicles the international quest to apply the

potentially life-saving power of stem cells. -- Scientific American Book Club" ...fast-paced, journalistic...informative and provides insight into the shape of things to come. The author mounts a persuasive case for the need to conduct research using both embryonic and adult stem cells, and pointedly takes to task religious groups and others who are opposed to the use of embryos in research. The portrait that Fox paints of stem-cell science and politics, and of the talented (sometimes flawed) individuals involved, is faithful to reality. She pitches her account squarely in the context of competition between individual scientists, labs and nations, not all of which have been proceeding honourably in the race to revolutionize medicine using stem cells. Few of the mainstream players are missed out. An entire chapter, 'Biopolis', is dedicated to Singapore (where I am based), which punches well above its weight in the stem-cell field. The Biopolis, a conglomeration of glamorous institutes with a world-class infrastructure, is just one of many places where Fox conducted a vast number of interviews, attended conferences and generally did her homework. The author has laboured to be thorough, and tells an interesting story." -- Nature, May 10, 2007(Cell of Cells) makes one think about the immense possibility science holds for society. It tells a great story...Aspiring students of science would benefit from this book, both as stimulation and as an example of the kinds of approaches undertaken in this particular scientific endeavor. The restrictions placed on hES cell research by religious groups will only delay success (assuming that there will be success at the end of this road). Fox's book is an excellent introduction to the field of stem cell research and makes for interesting and entertaining reading. -- The Journal of Clinical Investigation, September 4, 2007

Laboratory dramas - Stem cells: Four books reflect on the most operatic field in science WHY does embryonic stem-cell research cause such dramas? These books propose two perspectives. Three journalists--Eve Herold, Seth Shulman and Cynthia Fox--each suggest that this is a new topic that has been hijacked by a small group of political hotheads in America. By contrast, Hannah Landecker, an anthropologist at Rice University, Texas, charts 60 years of tissue-culture science. Over this period cells gradually came to live free from bodies, then experiments conjured them bit by bit into freezable, mass-produced objects and eventually into chimeras with parts from more than one species. Together, the two perspectives explain why all things stem cell slap the layman in the face, and why his shock bewilders many a scientist. Embryonic stem cells clump together as a tiny and distinct blob inside fluid-filled balls called blastocysts. That is what embryos look like when they are between five and seven days old. To conduct experiments on embryonic stem cells, scientists extract the clump from its blastocyst (destroying the rest of the embryo in the process), and then keep the stem cells separately in Petri dishes. Doing so maintains each stem cell's potential to develop into any type of cell in the human body by removing it from the chemical signals of other cells that would otherwise prompt specialisation. Alone in their Petri dishes, embryonic stem cells are primed for anything, making them unique tools for research and therapy. They divide and divide, forming populations of identical copies of themselves known as lines. It is the blastocyst destruction in this process that ideologues perceive as morally reprehensible. By equating it to killing babies they entangle the science in the politics of abortion. Ms Herold argues strongly against such views. Her book points out that giving individual rights to a blastocyst is problematic. At that early stage, embryos can split to form twins or triplets. Or pairs of blastocysts can fuse and develop into a normal baby, who grows into a healthy adult. Ms Herold also points out a number of inconsistencies. Federal funding of stem-cell research has been withdrawn as a result of pressure by people--a minority among taxpayers--who take a moral stand against it. Yet people who disapprove of using animals to conduct medical research still contribute to it through the federal taxes they pay. And why does destroying blastocysts in the name of finding cures evoke such tigerish protests when most fertility clinics have for years routinely disposed of them as medical waste? Using arguments similar to those made by Chris Mooney in "The Republican War on Science", Mr Shulman, by contrast, considers the political misrepresentations of stem-cell science. Just over six months into his presidency, Mr Bush declared on television that he would end federal funding of most stem-cell research. It was his first national television address. Publicly funded work could continue on 60-or-so genetically diverse stem-cell lines, Mr Bush said. But the presidential lines, as they came to be known, numbered about two dozen, not 60, and the immediate effect of the decision left 11,000 frozen American embryos that had been donated for research hanging, quite literally, in liquid nitrogen. Researchers cherish lines of embryonic stem cells. They think delicate chemical husbandry will one day yield a method to grow the cells into replacements for dead and diseased tissue. A human egg, with its nucleus swapped for that of a patient's skin cell, can behave as if it has just been fertilised by a sperm and grow into a blastocyst. The clump of stem cells in the middle of a blastocyst clone could then be coaxed into nerve cells for a patient with Parkinson's disease, or cardiac muscle for a heart-disease patient, without risk of rejection by those patients' immune systems. Ms Fox's book captures the adventures of scientists working towards this medical ambition with a realistic humanity. Hers is less workmanlike than the other books and refreshingly unideological. She tells of Egyptian scientists trying to establish a research centre in the midst of suicide-bombings. She describes underground stem-cell clinics in China and a Japanese doctor using the cells to give skinny women bigger bosoms. Away from the polarised propaganda, these are the many ambitions that stem-cell research is stirring up. In the final chapters of their books Ms Fox and Ms Herold chart the undoing of Hwang Woo-suk, once the global leader in the field, who lied about creating human embryonic stem cells by cloning. Ms Fox's examination of "Hwang-gate" is the more colourful. Mr Hwang's comments encouraged South Korean kindergartens to swap wooden chopsticks for metal ones. The metal

variety have more slippery pincers to work with and so provide apparently better training for the stem-cell technicians of the future. The officially titled "Supreme Scientist" also kept more than 60 bank accounts under different names and carried bags of cash between banks to obscure paper trails for his funding. Mr Hwang's fakery damaged the integrity of a science that could ill afford any bad news. Meanwhile, doctrinal activists still sing out their contradictions and exaggerations. Britain, so far one of the least hysterical countries, recently postponed a decision about whether making chimeric cells out of rabbit-egg cytoplasm and human nuclei should be illegal. Tabloid newspapers immediately began commissioning cartoons of Frankenbunnies. Yet few laymen realise that scientists first fused cells from different species as far back as the 1960s, as Ms Landecker describes. In those instances nuclei as well as cytoplasm came together and the hybrid cells made perfectly functioning enzymes that expressed the genetic code of two types of animal. That is much closer to what Mary Shelley imagined than anything British stem-cell researchers are proposing today. The level-headedness that can be gained from historical perspective is the value in reading Ms Landecker's account. Unfortunately, though, the signs are that this search for new medicines is becoming ever more operatic. -- *The Economist*, March 31, 2007

Peopled with quirky characters and crowded with strange and beautiful places, *Cell of Cells* reads like the best travel writing, but the author doesn't stint on the science, or the politics, of her subject. Cynthia Fox spent years touring the world's stem cell hotspots, staking out labs from Egypt to Israel to Singapore, and peering over the shoulders of scientists and surgeons. Her exhaustive legwork has produced a highly entertaining book. Dozens of key stem cell scientists get personality profiles, as well as a thorough accounting of their work and thought, including Israel's Shimon Slavin, the bone marrow transplantation pioneer who is now using stem cells to create dual immune systems; Jerry Yang of the University of Connecticut's Center for Regenerative Biology, the first scientist to clone an adult farm animal; and Harvard's Jonathan Tilly, who overturned decades of medical dogma by demonstrating the existence of mammalian oocyte stem cells. We get to know patients treated with stem cells, and are offered a surgeon's-eye view of their operations. Fox's often wry tone is ideal for capturing the excitement, and the hype, that accompany any promising medical advance. Fascinatingly, she was researching the book during the spectacular fall of Seoul National University researcher Hwang Woo Suk, whose reports of making the world's first human cloned stem cells were eventually exposed as fraud. We follow Hwang on his way up, basking in the attention of admirers at international meetings and whisking Fox through his state-of-the-art lab. And when the time comes to tell of Hwang's disgrace, Fox does an excellent job of helping the reader keep the characters involved, and their misdeeds, straight. *Cell of Cells* opens with the words of researcher Susan Fisher: "Science is like a stream of water. It finds a way." And Fox provides us with a compelling account of just what this means in today's world of "presidential lines", Singaporean billions, and scientists as rock stars. Let's hope she brings us along on her next voyage. -- *The Lancet*, April 21, 2007.

Science journalist Fox traveled to Egypt, Israel, Singapore, Japan, China, Korea, and the United States to talk with scientists, patients, and physicians dealing with stem cells through such work as laboratory research in mice; clinical applications in oncology, cardiovascular medicine, tissue engineering, regenerative medicine, and cosmetic plastic surgery; and attempts to clone mammoth DNA in Siberia. More is happening in the United States than might be readily apparent, given the ban on federal funding. But other countries are definitely racing to take advantage of U.S. restrictions. The issues are as much political as scientific. The promise of stem cells may never be exactly as hoped for, but some patients are being helped in truly new ways. A glossary with definitions and acronyms of all the varieties of stem cells--e.g., adult, embryonic, human embryonic--would have been helpful, but this is both a good introduction to a topic that isn't going away and a gripping and accessible guide to the ongoing work. Recommended for almost any library. [See Prepub Alert, LJ 9/1/05.]--Mary Chitty, Cambridge Healthtech, Needham, MA Copyright 2007 Reed Business Information. -- *Library Journal*

When President George W. Bush took office in January 2001, he quickly made it clear that he was not in favor of research on human embryonic stem cells. That August he sealed off access to federal funds for research on all but a few (now suboptimal) lines of human embryonic stem cells. His action not only caused stem cells to become a national political issue but also emboldened any country that wanted to compete with the United States in this research. The global race to establish dominance in a field with enormous scientific, health, and commercial possibilities was on, but with U.S. participants denied federal funding. In *Cell of Cells*, Cynthia Fox brings her impressive talent as a science writer and journalist to telling the story of this race. The hefty book offers a great read for anyone interested in the topic. Fox makes the story an adventure. She carries us to unlikely places, beginning with a camel ride to the Pyramids with an Egyptian stem cell researcher. She then flies to Israel to meet the scientist with whom the Egyptian wanted to collaborate (politics made it impossible). Israel's Joseph Itskovitz-Eldor provided four of the five lines to Jamie Thomson for their seminal paper on the first human embryonic stem cells. With a journalist's eye, Fox details her interviewees' offices, labs, mannerisms, and habits--even the views they see each day. Those details, impossible to obtain from a scientific paper, make the researchers come alive. Moving on to Singapore to describe stem cell work in the lavish research city of Biopolis and then on to Australia, Japan, China, and Korea, Fox accurately reveals the sociological and technical issues that stem cell research involves. For nonscientists, she gives pithy but effective explanations without disturbing the flow; for scientists, the book is a smooth read because Fox does not dumb down scientific terminology. The knowledge she acquired in her journeys is astonishing in range and depth, and she cites papers from the primary literature as rungs on

the ladder to her overview. (The book includes 43 pages of references and interview notes.) Fox creates indelible images. Her fly-on-the-wall description of a kidney transplant and chimeric stem cell operation at Massachusetts General Hospital is riveting, as is the almost smelly account of extracting oocytes for tissue cloning from pigs. In Jerry Yang's lab, she witnesses the Star Wars-like drama of remotely controlling pipettes to enucleate oocytes for somatic cell nuclear transfer. She tells the desperate stories of patients with heart failure, autoimmune disease, kidney failure, and Duchenne's dystrophy. She also warns of the trap of unethical, unscientific stem cell treatments in locations such as Moscow, Ukraine, and the Caribbean. This is not a book to be read while multitasking. Fox explains complex concepts and introduces numerous places and people. There are plenty of main characters--including Irv Weissman, Ron McKay, Shimon Slavin, Alan Colman, Ian Wilmut, Steve Minger, Wise Young, Doug Melton, Mahendra Rao, and the now disgraced Woo Suk Hwang--and some appear repeatedly. The author's fascination with "science trouncing science fiction," the potential of stem cells, and our desire to learn what happens next make this a rare can't-put-it-down science book. It reminds me of the fun of first reading *The Double Helix*. There are fights between and within labs, gossip, and different cultures, but there are also knowledge and exhilarating progress. *Cell of Cells* is a serious book, spiced up by Fox's wit and storytelling. What might have originally been the climax of the book occurred when Hwang became the first to publish work claiming the generation of a human embryonic stem cell line from a cloned blastocyst. South Korea seemed poised to win the race to therapeutic cloning, but the tale became a Greek tragedy of hubris and downright lies. It was as if in the space race Neil Armstrong had faked the Moon landings. Hwang's seeming triumph unraveled, slowly at first and ever faster as many of his claims were undermined. Because Fox wrote the book between 2003 and 2005, she probably had to go back and add "appeared to" or "apparently" to every reference to Hwang's results and then create a new last chapter, "The Fall of Seoul and the Rise of San Francisco." She writes, "the Woo Suk Hwang fraud is the biggest in science history in terms of the number of guilty parties." Bush has twice vetoed congressional bills to increase federal funding for human embryonic stem cell research. *Cell of Cells* illustrates the consequences for global science, states that fund their own researchers, and the dashed hopes of those who need potential treatments. Fox eloquently chronicles the consequences of this isolationist policy and squarely advocates a rational approach to funding research on both adult and embryonic stem cells. --M. Ian Phillips -- *Science*, July 20, 2007

About the Author
Cynthia Fox is an award-winning writer, focusing on science, whose work has appeared in publications including *Wired*, *Fortune*, *Rolling Stone*, *Esquire*, *The Scientist*, *Engineering in Medicine and Biology*, and *Discover*. She lives in Brooklyn, New York.