Oöcyte markets: global tissue economies and women's reproductive work in embryonic stem cell research

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Abstract

Somatic Cell Nuclear Transfer (SCNT) research, otherwise known as therapeutic cloning, requires large numbers of research oöcytes, placing pressure on an already limited supply. In the UK, Canada, Australia, Singapore and most of Western Europe, oöcytes are made available through modestly reimbursed donation, and, due to the onerous nature of donation, the existing demand for reproductive oöcytes far outstrips availability. SCNT research will place this system under even greater pressure. This paper investigates the growth in a global market for oöcytes, where transnational IVF clinics broker sales between generally poor, female vendors and wealthy purchasers, beyond the borders of national regulation, and with little in the way of clinical or bioethical scrutiny. It considers the possible impact that SCNT research will have on this global market, and suggests some ways to improve the protection, security and power of vendors.

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Ian Wilmut, creator of Dolly the sheep, recently called for young British women to donate oöcytes to assist with stem cell research into motor neurone disease. British scientists believe that somatic cell nuclear transfer (SCNT)[1] research, sometimes called therapeutic cloning research, is hampered by a shortage of good quality oöcytes, and a reliance on those rejected as non-viable for IVF. In an interview with *The Guardian*, Professor Wilmut said, 'I have never doubted that women would donate if they thought we were helping people to have treatment. Our hope and belief is that women who have seen the devastating effect of this disease will be prepared to make such a donation' (Sample & MacLeod 2005). Meanwhile, the Human Fertilization and Embryology Authority, the statutory body that regulates fertility medicine and embryonic research in Britain, has taken a series of measures to improve the availability of oöcytes, both for fertility treatment and for SCNT research. Following the *SEED Report* (HFEA 2005), which reviewed gamete and embryo donation in Britain, the HFEA has both increased the levels of reimbursement for reproductive donation and in a separate move, made so called 'research donors', (women who are willing to donate oöcytes for SCNT research), eligible for discounted IVF services.

These measures have been quite controversial, precisely because they depart from the altruistic ethos to which Professor Wilmut appeals. His call for donation plays on the ethic of the gift relation, articulated by Richard Titmuss in his classic study of blood

donation and the role of altruism, *The Gift Relationship: from Human Blood to Social Policy*. Wilmut follows Titmuss's conviction that donors should act not out of self-interest but out of a sense of collective belonging and duty to the national body politic (Waldby & Mitchell 2006). Titmuss's nation-building, egalitarian proposals, published in the late 1960s, were directly opposed to the marketing of human tissues, their exchange for a price. The commodification of such an intimate part of the person was, for Titmuss, a synecdoche for the reduction of all forms of relationship to the contractual mechanisms of capitalism, and the destruction of any domain of social life outside of market relations. It is, he implies, on a continuum with slavery, the commodification of body parts rather than the body as a whole (Titmuss 1970/1997).

The gift relation is well entrenched in Britain and most of Western Europe, both as an ethical ideal and a regulatory norm. So, for example, the EU's Tissue Directive 2004/23/EC (March 2004) states that:

> As a matter of principle, tissue and cell application programs should be founded on the philosophy of voluntary and unpaid donation, anonymity of both donor and recipient, altruism of the donor and solidarity between donor and recipient. Member States are urged to take steps to encourage a strong public and non-profit sector involvement in the provision of tissue and cell application services and the related research and development." [Preamble (18)]

While the HFEA's new policies are couched in the language of reimbursement and in kind support, they are controversial because they involve a restricted form of marketisation, where oöcytes are put into circulation via an increase in cash and treatment incentives rather than through an act of selfless generosity to the less fortunate. The reason for the HFEA's *realpolitique* here is quite simple: the gift relation, in its strict sense, is proving an inadequate framework to meet an ever expanding, worldwide demand for oöcytes[2]. This unmet demand is long standing. Prior to the advent of SCNT research, oöcytes were in demand for assisted reproduction, and this demand has continued to grow as the use of IVF becomes more common. Almost all UK fertility clinics report an acute shortage of viable oöcytes for women in need of donation (Echlin 2005).

This shortage of oöcytes is exacerbated by constraints on supply. As Sexton (2005) notes, women in Britain, and other developed nations that regulate oöcyte donation through gift systems, are generally unwilling to donate oöcytes unless they are already themselves within the IVF system. While blood donation systems generally rely on the voluntarism of their donor panels, this method has failed in the case of oöcytes, because their donation is so onerous. It is constrained by the recalcitrance of the materiel, and the difficulty, time, pain and risk associated with giving. Oöcytes are difficult to disentangle (Callon 1998, Waldby & Mitchell 2006) from the body. Unlike semen, they are not a self-renewing, copious and accessible tissue. Women have a fixed number at birth, and the normal biology of reproduction involves the release of a single oöcyte per month. While men can go on producing semen for most of their lives, women eventually run out of

oöcytes, at menopause. Unlike semen, oöcytes are never detached from the body in the normal course of events. The significance of in vitro fertilization technology is that it allows the externalization of oöcytes from the female body. However, IVF did not become a viable clinical treatment until it could move beyond the single oöcyte produced each month as part of the menstrual cycle. IVF treatment now involves multiple oöcyte production and a major reorganization of reproductive biology. In a process termed ovarian stimulation, drugs are administered to shut down the woman's normal reproductive cycle, and then other drugs administered to stimulate the development of multiple follicles. Harvesting requires invasive surgery. The procedure involves,

> Daily subcutaneous hormone injections over a period of 7 to 10 days. Mature oöcytes are retrieved under ultrasound guidance by the insertion of a needle through the vagina in a brief surgical procedure that requires anesthesia (see diagram). The ethics committee of the American Society for Reproductive Medicine cites an estimate that egg donors spend '56 hours in the medical setting, undergoing interviews, counseling, and medical procedures related to the process'. The injections are uncomfortable and have side effects. The retrieval of oöcytes carries risks, such as those of anesthesia and bleeding (Steinbrook 2006: 324).

It also carries the risk of ovarian hyperstimulation syndrome, a usually unpredictable response to ovulation induction (Steinbrook 2006) that involves pain, abdominal inflammation, possible renal failure and infertility, venous thrombo-embolism and

cardiac instability. It can be fatal. Up to 5% of women in treatment develop hyper-stimulation syndrome (Magnus and Cho 2005, Delavigne Rozenberg 2002). Moreover, there is little research into the long-term risks of ovarian stimulation; whether there may be implications for later fertility, hormonal health or the general health of reproductive organs (Dickenson 2005). In short, ovarian induction for both fertility treatment and donation is onerous and risky. Dickenson (2005) argues that oöcyte donation is more like live kidney donation than sperm donation, in terms of the singularity of the tissue, the risks involved in the process and the possibility of long-term consequences.

Research oöcytes: global demand

A demand for research oöcytes for SCNT simply places greater pressure on an already short supply of oöcytes and on female reproductive biology more generally. A striking feature of contemporary biotechnical innovation is its ever more ingenious use of aspects of female reproductive biology – particularly embryogenesis and the fetal-maternal blood system – to generate therapeutic tissue. As Brown and Webster (2004) note, female reproductive biology is increasingly used by contemporary biomedicine as a generative site separate from the production of children, 'through which biological materials and information is harvested for scientific, medical and commercial purposes' (Brown and Webster 2004: 71). Reproductive biology has been redistributed throughout diverse areas of regenerative and diagnostic medicine, and assisted reproduction technology has become central to many biomedical domains unconcerned with the production of children. Like *in vitro* embryos, *in vitro* oöcytes are point where this reproductive

potential bifurcates. Both can be transferred to a recipient, and used to produce another human life, a child; and both can be biotechnically reconfigured in a laboratory, diverting their pluripotency into the production of embryonic stem cell lines. This double capacity to produce both new offspring and therapeutic stem cell lines make oöcytes highly desirable, so that demand continues to escalate.

The sheer numbers of oöcytes required to mount a serious research effort further drives demand here. The now discredited Professor Hwang's work in South Korea gives an indication of the ratios of oöcytes needed to make a viable blastocyst, and of blastocysts need to strike a viable stem cell line. In one of his studies, sixteen donors produced 242 oöcytes, which in turn produced 30 blastocysts and finally, one cell line (Hwang et al. 2004). In more recent revelations, the Seoul University inquiry in Hwang's activities found that between November 2002 and November 2005, his laboratory used 2061 oöcytes produced by 129 women, an average of 16 oöcytes each (Steinbrook 2006). The implications of these kinds of ratios for eventual therapeutic applications of ESC research are quite daunting. Sexton (2005), extrapolating from Hwang's figures, claims that almost half the young women in Britain would need to donate oöcytes simply to treat those with diabetic conditions.

> There are an estimated 1.4 million diagnosed diabetics in the UK, and an estimated undiagnosed 1 million people. South Korea [ratios of oöcytes donation to ESC line production] would suggest that two women would need to provide their eggs in order to derive one matched stem cell line for each diabetic –

> implying a total of 2.8 million women providing their eggs to treat UK diabetics. The estimated number of women aged between 20 and 34 years old resident in the UK as of mid-2004 is 5.8 million, implying that one in every two to three women would need to go through the egg retrieval process just to treat diabetics (Sexton 2005: 9).

While these estimates are at best very speculative, they do give a general indication of the kind of increasing pressures on oöcyte supply that a large-scale SCNT clinical endeavor would entail. They also indicate that the compliance, generosity and general agency of female populations will become more central to the development of the regenerative medicine industries, an issue that is beginning to martial significant feminist concern (Cooper 2007, Dickenson 2005, 2007, Dodds 2004), and which I will further pursue here.

The measures introduced by the HFEA may go some way to improving oöcyte supply in the UK, although the measures will not satisfy scientific concerns that oöcytes provided through fertility treatment are, by definition, biologically compromised. However, I would argue that the expanding demand for research oöcytes will be more consequential for the female populations of nations that do not regulate oöcyte transfer through gift systems. While compensated gifting and regulation along the lines of solid organ donation is the norm in the UK, Australia, New Zealand Canada, Singapore and most of Western Europe, many states treat gametes as a separate category, or simply lack a regulatory regime. So, for example, in the USA, gametes do not fall within the purview of the National Organ Transplant Act 1984 (Steinbrook 2006) because they are classified

as ‘self-regenerating tissue’, and hence can be bought and sold. In Spain, oöcyte donation does not come under the authority of the organ donation legislation. These countries now have a vigorous and privately controlled internal trade in reproductive oöcytes, in each case linked to unregulated transnational trade. Nations that attempt to protect oöcyte donation from free market forces find that nationally based regulations are being increasingly undermined by tissue trading *between* states, facilitated by medical tourism, global medical commerce and the ever-expanding demand for oocytes[3].

This global market has serious implications for women not well protected by legal structures, bioethical regulations, adequate income or a feminist influenced civil society (Dickenson 2004). The Hwang case is telling in this respect. Some of the oöcyte donors for his studies were young research staff in his own laboratory, with all the implications of coercion and absence of meaningful informed consent this entails. Hwang’s laboratory also used numerous paid oöcyte suppliers (Steinbrook 2006). This has also raised issues of informed consent and the problem of full disclosure of risks to donors when demand for tissue is high. At time of writing, a coalition of thirty-five women’s groups were involved in a suit for compensation against the South Korean government on behalf some twenty per cent of the women who provided eggs on the grounds that they had not been informed of the risks of donation. In some cases, the women had required hospitalization due to the side effects of ovarian hyperstimulation (Hwa-Young 2006)

In the next section I will consider the growth of global oöcyte markets. I will focus on southern Europe (Spain, Crete), Romania, and the USA as three examples of the ways

these markets are configured – as a medical tourism market, an export market, and a highly stratified, predominantly internal market, respectively. I will consider the possible effects that the new demand for research oöcytes is having on such markets. I will also consider the place that oöcyte vendors (i.e. women who sell oocytes rather than donors, who give them) occupy in the global knowledge economies, and what this suggests in terms of improving regulation and protection for such women.

Global Oöcyte Markets and Women's Reproductive Labour

i. Reproductive Tourism

Shortages of gametes and regulatory restrictions on availability have created a market for reproductive oöcytes among wealthy North West Europeans. To supply this demand, and to circumvent national regulatory systems, privately run fertility clinics have set up in countries with more permissive regulations on the fringes of Western Europe. Clinics in southern Spain and Crete offer 'IVF holidays' to attract wealthy north European IVF tourists who have not been able to obtain satisfactory treatment at home**.** British IVF tourists cite the shortage of oöcytes in the UK IVF system as a major reason for their trip, particularly since donor identity is no longer anonymous (France 2006). German and Italian tourists are also common, because oöcyte transfer is illegal in these countries. Unlike most of the rest of Western Europe, fertility clinics in Spain are largely unregulated, a liberal approach that has its origins in the post-Franco government's desire to remove state restrictions on reproduction[4]. Clinics recruit through beauty parlors,

supermarkets, colleges and by word of mouth, and pay oöcyte suppliers about £1000 per procedure, with a premium paid to fair 'northern looking' donors (France 2006). A recent investigation by the UK *Observer* newspaper found that fertility clinics in the Ukraine and other parts of the former Soviet Union recruit young east European women and send them to clinics in southern locations - Cyprus and Belize, for example - to provide oöcytes for north European couples, who pay between £8000 and £12,000 per treatment. East European women are the preferred providers in the European oöcyte market because of their fair coloring and 'Caucasian' appearance, which matches that of the north European purchasers. As Pollock (2003) notes, 'in anonymous egg donation, phenotype is privileged above all else. Physical similarity between donor and recipient makes the donation invisible' (Pollock 2003: 253).

The women interviewed reported being paid between £300 and £600 per procedure, with a higher fee if they produce more oöcytes per procedure. They also referred to friends who had donated multiple times. One informant, a nurse working in the industry, 'told *The Observer* that some women viewed egg donation as their main source of income, going through the process of being injected with hormones at least five times a year' (Barnett and Smith 2006). Some also combined oöcyte vending with a stint of work in the local sex industry.

Here we can see a stratum of the young, female population in Eastern and Southern Europe who supplement low incomes with reproductive labour for fertility clinics and older, north European couples. We also see the kind of mobility involved in the global

oöcyte market, (and its worrying overlaps with sex trafficking). Both vendors and purchasers elude national regulatory restrictions by visiting clinics in a third location where regulation is minimal or absent. As long as the oöcyte purchaser falls pregnant in the third location, any national import and export restrictions on gametes or embryos are inapplicable.

ii. The Romanian Export Market

The GlobalART clinic in Bucharest presents a different business model of global mobility and oöcyte brokerage. The clinic is part of an international chain, linked to GlobalARTusa, a US-based oöcyte broker and an Israeli fertility clinic. The clinic was set up precisely to prevent oöcyte purchasers from having to travel overseas to find oöcyte vendors. Instead, it recruits young Romanian women to provide oöcytes and fertilizes them with sperm from the male partner in situ, before transporting them back to the USA or Israel. At time of writing, this was the only clinic in the world known to operate along these lines (Nahman 2005). Young women are recruited by word of mouth and are paid about US $200 per procedure. An ethnographic study of the clinic, involving two weeks of observation and interviews with twenty of the oöcyte vendors, as well as staff, found that the fee amounted to between two and four times the women's monthly salary. Some of the women interviewed had sold oöcytes several times, or intended to sell again. All the women interviewed stated that they sold their oöcytes because of financial necessity.

> I asked the donors why they donate, what led them to donate their ova. They told me that they donate 'out of desperation'. They said they were desperate to get out of constant debt, so they can buy themselves basic 'necessities' such as clothes, new bedroom furniture, makeup, cigarettes. One woman was behind on her rent for two months and so decided to sell her eggs rather than borrow money (Nahman 2005: 224).

Most had salaries that barely covered subsistence (rent, food) and selling oöcytes was their only means of paying for clothing, study, basic home maintenance or their children's needs. Many stated anxieties about the risks involved in the procedure but felt that they had little option, given debts and other financial pressures. There is evidence that healthcare standards at the clinic are variable or below acceptable benchmarks. The interviewees stated that they received higher fees for greater numbers of oöcytes per cycle, or were allowed back frequently to sell oöcytes, a practice also reported by the women interviewed by *The Observer*. Such a practice is clinically ill advised, as it encourages higher levels of ovarian stimulation and the women run a greater risk of hyper-stimulation syndrome[5]. In 2005, two young women tried to get criminal charges laid against the clinic for neglect and fraud. Both sold oocytes to the clinic over several procedures, yielding twenty each time. Both suffered serious cases of ovarian hyperstimulation syndrome. They claim that the clinic did not adequately describe the risks of the procedures, and took no responsibility for their illness (Magureanu 2005). At time of writing, the case was still under review. In 2004, the UK Human Fertilisation and Embryology Authority placed an embargo on importation of gametes from the Romanian

clinic, because of concerns about the consent procedures used in the clinic, followed by a controversial site visit to inspect the facilities (Sexton 2005).

It is evident then that East European women in particular are the most desirable source of oöcytes in the European reproductive market. They have fair skin and coloring, and they are an economically dispossessed population, struggling to find a survival niche in the newly deregulated, former soviet economies. As I discuss further below, the development of an SCNT oöcyte market would expand the possible vendor population to women with other ethnic backgrounds, as coloring and class are irrelevant for tissue used in stem cell research. While there appears to be no evidence that this European market is being used to purchase research oöcytes as yet, the availability of vendor populations and an established network of recruitment clinics indicates that there will be few barriers at the ground level to purchasing oöcytes for SCNT research. Barriers begin to appear at the import/export level, if national licensing systems exist for imported reproductive materiel, and if these systems are alert to the bioethical and social justice aspects of oöcyte markets. In the absence of such licensing, or in the case of black markets developing for research oöcytes, demand may well be met by resorting to purchase on the global market.

iii. The US Oöcyte Market: Niche Markets, Stratification and the Stem Cell Industries

The USA has the most well developed and lest regulated internal market for oöcytes. It also has the greatest number of stem cell companies, and privately funded stem cell

research is unregulated at a federal level. Reproductive oöcyte trading is routine. The US Centres for Disease Control and Prevention report that in 2002 alone, purchase oöcytes were used in 13,183 (11.4 percent) of the 115,392 procedures involving assisted reproductive technology, for fees of around $4,000 to $5,000 per cycle (Steinbrook 2006: 324). Like the European market, the US reproductive oöcyte market is stratified according to the appearance and 'racial' characteristics of the vendor. Premiums are paid for vendors with additional desirable characteristics, particularly pretty, athletic women at elite colleges, who are routinely offered fees of between $20,000 and $100,000 per cycle (Hamilton 2002).

There are no Federal regulatory barriers to prevent the reproductive market in oöcytes becoming a market for research oöcytes as well. US bioethicist Jeffrey Kahn argues that the general US aversion to public funding for embryonic stem cell research makes oöcyte and embryo purchasing on an open market more likely, in that funding agencies provide no funding for embryo collection, even in public funding situations.

> Because of sensitivity over the status of human embryos and federal law that prohibits tax dollars from being used for embryo research, the U.S. National Institutes of Health (NIH) has proposed that it will fund research on stem cells but won't fund the collection of the stem cells themselves. This leaves private companies to act as suppliers of stem cells. Where will the embryos come from, what limits should there be on embryo use, and how close are we to a market in human embryos? …The government is effectively the market maker--a public buyer creating a demand to be filled by private suppliers (Kahn 2000: 1-2).

It is currently illegal for couples or women to sell their spare IVF embryos however, so private suppliers would be likely to target financial incentives at oöcyte providers. While reproductive oöcytes provided by fair-skinned college student fetch high prices, phenotype is irrelevant in SCNT research. I would argue that there is considerable scope to extend research oöcyte markets to poor, uneducated, and dark-skinned women, women normally excluded from the reproductive market except in a capacity as surrogate mother[6] (Pollock 2003). In the US, the juxtaposition of poor, ghettoized populations with high technology corridors - for example around Bethesda, Boston, Raleigh-Durham and Southern California – make these kinds of markets even more feasible. Here we can see an internal version of the extra-territorial oöcyte trade already described, with poor female populations within the nation-state acting as potential vendors for national biotechnology industries.

One business model for this kind of enterprise is the Bedford Stem Cell Research Foundation, founded in 1996 in the Boston area. The Foundation claims to be the first organization in the world to solicit women to 'donate' oöcytes purely for research. Since 2000, it has recruited oöcyte vendors from the Boston area via newspaper advertisements, paying them about $4000 per procedure. According to Sexton (2005), the majority of oöcyte providers for this program are unemployed women. The foundation conducts research within its own laboratories, supplies research oöcytes to Advanced Cell Technology, and is set to supply other Boston area researchers. The website (www.bedfordresearch/org) emphasizes the use of 'mild hormone stimulation' to avoid hyperstimulation syndrome, and the generally high level of screening, informed consent

and ongoing care provided for oöcyte suppliers**.** The foundation only accepts women between the ages of 21 to 35, and they must already have at least one child, as a demonstration of viable fertility. According to an interview with the Director, Anne Kiessling, by the end of 2005, 391 women had inquired about the program. After screening, 28 started hormone injections, and 23 completed the process. Eight of those 23 donated twice; three donated three times. The donations yielded 274 oöcytes, at an average cost of $3673 per egg, once screening costs were factored in (Vogel 2006). No independent assessment of this program was available at time of writing. However, what is striking about its approach is the evident concern to head off possible objections about the exploitation of its vendors, and to underwrite the ethical provenance of the oöcytes its supplies, within the terms of the US free market.

Discussion

Davis (2004), Sassen (2002), Ehrenreich (2002) and other analysts observe that the restructuring of the global economy since the 1980s has had a disproportionate effect on women, as public funding for health and welfare is rolled back, formal unskilled work disappears and women are forced to invent new productive niches in the so called 'informal' economy. In particular, women often support themselves and their children by recasting their feminine capacities for nurturance, maternity, and sexuality as negotiable assets, able to be traded for money in first world countries where they can find employment as maids and nannies, as cleaners and waitresses, and as sex workers of various kinds (Sassen 2002, Ehrenreich 2002). In Sassen's words, they form the 'lower

circuits' of globalization, shoring up knowledge worker households, with their high consumption patterns and need for household assistance and 'wifely' services no longer performed by educated, professional women.

> Through their [feminized] work in survival circuits …women, so often discounted as valueless economic actors, are crucial to building new economies and expanding existing ones (Sassen 2002: 256).

It is women in this kind of circumstance, living at subsistence level, seeking a niche in the expanding areas of the global economy, who can be readily targeted for oöcyte purchase. Nahmen notes of her interviewees in the GlobalART clinic that they, and Romania itself, are 'in a frenzied rush toward consumption within the flexible global economy' (Nahman 2005: 232). Within the United States, as within most other neoliberalised knowledge economies, economically disenfranchised populations live adjacent to, yet excluded from, the laboratories, universities and technology parks that employ the high-trained scientific personnel who figure as the key players in the bio and information economies. This is the situation not only in the Northern post-industrial democracies but also increasingly in China and India, where biotechnology research capacity is expanding rapidly in the absence of effective oversight or regulation (Salter, Cooper & Dickins 2006, Bharadwaj & Glasner 2004, Jayaraman 2005). Both China and India have large, impoverished populations, extensive networks of fertility clinics (Chu, 2001, Khanna 1997) and burgeoning stem cell industries. The Indian state is currently facilitating the mobilization of sectors of its rural population into US-based clinical trials

(Rajan 2006), suggesting that there would be few political barriers to research oöcyte marketisation and the mobilization of female vendor populations for the stem cell industries.

For such poor women, the production of oöcytes for a fee gives them a position in the lower circuits of the reproductively based biotechnology industries, and allows these new knowledge economies to develop. At the same time, the essential reproductive labour performed by such women goes largely unrecognized, in an area dominated by ethical concerns for the embryo and by a privileging of intellectual property labour over the other kinds of prior, embodied labour. Oöcyte vendors are extremely vulnerable, with little in the way of clinical or insurance protection, compensation or negotiating power. Clinics are privately run, with strong financial incentives to maximize their oöcyte providers' 'productivity' with strong ovarian stimulation regimes, and little or no external control over clinical and bioethical standards.

Conclusion: Reproductive Labour and Global Regulation

In March 2005, in response to Europe wide media coverage of the Romanian clinic, the European Parliament passed a resolution on human oöcytes. It states that 'the procurement of cells may not be subject to any pressure or incentive, whilst the voluntary and unpaid donation of egg cells must be guaranteed, so that women do not become 'suppliers of raw material'.[7]

Similarly, in the USA the dramatic inflation of prices around reproductive oöcytes over the last five years, and the expansion of markets to include research oöcytes have sparked concern among many key actors. In 2005, the US National Academies of Science recommended in its 'Guidelines for Human Embryonic Stem Cell Research' that no payments should be provided for donating gametes for research. The chair of the National Academies committee stated that the recommendations were justified by the sensitivity of egg donation for stem-cell research and by uncertainties about the actual risk of severe complications in donors (Steinbrook 2006). Some liberal supporters of stem cell research, in assessing the Californian Stem Cell Initiative, argue for 'public sector bodies with the power to establish and enforce comprehensive regulations that apply to both publicly and privately funded research' (Reynolds *et al.* 2006: 17) . They advocate adequate reimbursement rather than payment, an institutional separation between oöcyte harvesting clinics and stem cell research companies, and an ongoing duty of care to donors, with adequate follow-up and research of long-term consequences.

Each of these approaches has certain merits and plausibility. It may be possible to introduce an EU wide regulatory system for the control of oöcyte sourcing, with uniform compensation regimes and checks on clinical standards and informed consent procedures. As I have already discussed, the non-commodification of the human body is well entrenched as a norm in EU instruments and regulations around human tissues, and most states in Western Europe observe this norm in their national legislation and regulations. Likewise, in the US, while federal level controls seem unlikely[8], individual states may cooperate in the introduction of market regulation, or the public regulation model

advocated by the *Center for Genetics and Society* (Reynolds *et al.* 2006). Moreover, in the wake of the worldwide scandals over Professor Hwang's questionable methods of oöcyte acquisition, US state administrations, stem cell research companies and professional bodies may be newly sensitized to the potentially devastating effects of bioethical issues on research reputation. There is already some evidence for this. The California Institute for Regenerative Medicine, established in response to the 2005 California stem-cell initiative, prohibits payment for oöcytes, although it permits compensation (Steinbrook 2006), aligning it more closely with the West European and Commonwealth norms, and presumably smoothing the way for international collaboration.

However, none of these approaches will necessarily work in controlling the oöcyte trade at these nations' geopolitical margins. The well-established, highly mobile, somewhat clandestine and transnational nature of both recruitment clinics and vendor populations suggest that attempts to ban oöcyte markets will simply push trade underground, into black markets with more likelihood of criminal involvement and further possibilities of harm to the women. The apparent overlaps with the global sex trade, uncovered by the Observer report, are particularly concerning in this regard. In this situation a combination of international human rights agency involvement, along the lines of agencies involved in the global sex industry, development aid and harm minimisation approaches (e.g. international guidelines on clinical and bioethical standards, duty of care etc) may offer the best approach. Along these lines, the *International Society for Stem Cell Research* launched a guideline task force in early 2006. Involvement of UN agencies, especially the

WHO and the UNESCO Bioethics committee may be beneficial. Concerns have already been expressed within the UN about the threat to poor women's health from the global demand for research oöcytes [9]. Within the boundaries of Western Europe, the USA, Israel and other regulated nations, fertility clinics that depend on the global oöcyte trade are probably the best strategic points for enforcement of adequate consent, clinical care and payment beyond these boundaries. That is, like the UK stem cell bank, they can bring pressure to bear on the conditions of their suppliers, and refuse to traffic in oöcytes harvested in exploitative ways. This would in turn require uniform oversight of these clinic's operations and bioethical standards.

Finally, while it contravenes the European ethos opposing the commodification of the human body, there may be merits in considering oöcyte vendors in industrial terms; as essential reproductive workers in the supply chain of the stem cell industries, and as economic actors in their own right. Effectively the stem cell industries, genomics and other areas of the medical bioeconomy rely on the provision of human tissues, and at present the gift system often means that donors are simply treated as open sources of lucrative biological materiel that can be profitably privatised by biotechnology companies (Waldby & Mitchell 2006). The asymmetrical reliance on female reproductive biology for regenerative medical research, combined with the growing population of economically disenfranchised women in the developing world, suggests that more and more women may find themselves employed in some kind of clinical or reproductive labour that may be their main means of support. An approach to oöcyte supply that combines issues of safety, consent, and clinical conditions with those of workers rights,

organised representation for vendors and regulated negotiation of conditions, including follow-up care and insurance, may yield benefits in terms of harm minimisation and transparency. Most important of all, vendors themselves should be included in any policy formulation over the global oöcyte market, so that their expertise, experience and interests are taken into account.

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Endnotes

[1] Therapeutic cloning is based on the technique developed to clone mammals – somatic cell nuclear transfer or SCNT. This involves the creating of an embryo not by the usual fusion of egg and sperm, but through the *in vitro* insertion of the nucleus of a cell from an adult's tissues into an oöcyte. The oöcyte has had its own nucleus removed to make way for the introduced nucleus. This creates an embryo with the genome of the adult from whom the nucleus was taken. Such an embryo could be used to develop embryonic stem cell lines with the genetic material of an adult donor, which could in turn be used to produce transplantable tissues genetically compatible with the donor.

[2] Strictly speaking, this does not distinguish oocytes from other forms of donated tissue – virtually all tissues are in insufficient supply to meet demand, because demand is ever expanding, driven by new techniques and treatments. For more discussion see Waldby & Mitchell 2006.

[3] Again there is nothing unique about global oöcyte trading – it is driven by the same North-South relations of privilege and poverty that drives the global trade in live kidneys and blood plasma. See Scheper-Hughes (2000) and Starr (1998).

[4] Personal communication, Donna Dickenson.

[5] According to Adam Balen, a British Professor of Reproductive Medicine, interviewed by the Observer (Barnett & Smith 2006).

[6] Surrogate mothers are implanted with an already conceived embryo, and carry the foetus to term without making any genetic contribution of their own.

[7] European Parliament resolution on the trade in human egg cells Thursday 10 March 2005 – Strasbourg P6_TA(2005)0074

[8] Federal regulations seem unlikely given the US historical preference for decentralised, State-based regulation and professional autonomy and self-regulation. See Waldby & Mitchell (2006) for an extended treatment of the differences between West European and United States approaches to tissue regulation.

[9] These can be found at *Summaries of the work of the Sixth Committee*, the 58th General Assembly of the United Nations 2003.