



# From birds to babies and beyond: A chat with one of Singapore's 'fathers' of IVF

*Life spoke with Dr Soon-Chye Ng about his work in in vitro fertilization (IVF) and assisted reproductive technology (ART) – from the birth of Singapore's first IVF baby to the possibility of therapeutic cloning in the future – and about his journey from academia to private practice.*

**How did you get into the field of reproductive medicine?**

I didn't plan to study medicine; my original intention was to do marine biology. But my father had the final say and medicine it was. I graduated from the University of Singapore (now the National University of Singapore [NUS]) in 1974, but had to complete 2.5 years of national service before starting my specialty training. In

1977, I was the last enrolled trainee at the university – subsequently, all specialty traineeships passed to the control of the Ministry of Health. In 1979, I passed my specialist's examination and joined the University of Singapore as a lecturer in Obstetrics and Gynaecology. You have to remember that this was a very exciting period for reproductive medicine, with Louise Brown being born in 1978, and there was a lot of interest in IVF. The Department was already interested in infertility and the chairman of the Department, the late Professor SS Ratnam, was looking for someone to help develop IVF at the university. He knew of my strong interest in research, and he offered me the opportunity to go to Monash University for training in IVF. At that time, there were only two successful IVF centres in the world; one was the Bourne Hall team of Dr Steptoe and Professor Edwards and the other was the Monash University team under Professor Carl Wood and Dr Alan Trounson. Of course, at that time I didn't even know what an egg looked like! If I'd only known how difficult it was going to be, I might have chosen differently! But I just went in blindly and that was how it started. Our department pioneered IVF in the region and we achieved the very first IVF birth in Asia, on May 21, 1983. In those days, I was both the clinician and the embryologist; I belong to an old (and select) group of reproductive specialists that can do both. Since the early days, I have trained many people from all over Asia, both clinicians and embryologists, including Professor Ariff Bongso, who joined me in 1985 without any experience in human IVF.

**Who has been your most influential teacher/mentor?**

During my training I have been exposed to many people, but the one who made the most impact is Professor Ratnam because he trained me and he was instrumental in getting me involved in IVF.

**Tell us a little about your personal research interests.**

Apart from my clinical work in IVF, my main interest is in nuclear transfer. To pursue this interest, I went on a 9-month sabbatical to the Wistar Institute in Philadelphia to work with Professor Davor Solter. I spent time studying the male genome at various stages up to when it transfers into the egg. I looked at a range of immature stages from male spermatogonia all the way down to mature spermatozoa. I also developed new techniques related to micromanipulation. That was how I developed the technique subzonal

insemination (SUZI), in which the sperm is introduced under the zona. When I returned to Singapore, we began applying the technique clinically and the first SUZI baby was born in 1989. This work opened up the field of micromanipulation and I have many publications in this area. I have continued to research molecular aspects of male infertility and we have done a fair amount of work examining the effects of microdeletions in the y chromosome.

**What are you currently working on?**

My key interest is in nuclear transfer and the possibility of cloning, but since we cannot perform any cloning in the human, I started to work on a monkey model. I began to develop the intracytoplasmic sperm injection (ICSI) technique for the non-human primate, and we then moved on to nuclear transfers. We had the first publication of successful reproductive cloning in the monkey, but we have had no live births thus far. As far as I know, we are the first and only group with reported pregnancies in the monkey. This work is ongoing, with collaborators both within Singapore and overseas.

From left to right: Dr LC Foong, Dr Soon-Chye Ng and Dr Jothi Kumar



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### What impact will such research have on the practice of reproductive medicine in the future?

In terms of developments in the field, I think we will see some major changes. IVF in itself is probably not very exciting, but the offshoots from IVF have great potential, for example, nuclear transfer to develop patient-specific embryonic stem cells. This will be the new frontier. There are many parallel technologies that are moving forward and I think that will be quite exciting. For example, we now have very efficient egg freezing, so it may be possible in the future for females to postpone

childbearing by preserving their eggs. Other related developments that may come about include a different emphasis on the use of preimplantation genetic diagnosis (PGD) and screening (PGS).

### What are your personal research goals?

My personal research plans for the future would be of course therapeutic cloning in Singapore. In Singapore, there is a great emphasis on supporting and developing biomedical research, so this is a good place for me to be to achieve these goals.

### How has the management of subfertility evolved in Singapore since you started out?

Well, for the world as a whole, the success of the SUZI and ICSI methods has revolutionized treatment for the infertile male. In addition, we now have a much more complete understanding of male infertility, especially the genetic basis such as androgen receptor mutations and microdeletions of the y chromosome.

### How does the current practice of IVF in Singapore compare with other countries?

There are currently eight centres in Singapore performing IVF, and I think we are comparable to any good centre worldwide.

### What is the government position on subfertility treatment?

The Singapore government has been very supportive; for example, they allow patients to use Medisave funds to pay some of the costs of IVF and ICSI. The government is quite worried about our birth rate, which has dropped below replacement levels. However, the use of IVF isn't likely to have a noticeable effect on demographics as it involves such a small proportion of the population. But it is still an important complementary service.

### How do you see the practice of reproductive medicine changing over the next decade?

I feel that the government of Singapore is becoming more pragmatic; previously PGD and PGS were not permitted, but the authorities are now looking into that possibility and that of surrogacy, under specific conditions. In addition, the government is preparing the infrastructure for the possibility of therapeutic cloning, by introducing legislation such as the Human Cloning and Other Prohibited Practices Act 2004. So I think there is a slow shift towards the possibility of this sort of work here in Singapore, but under very strict regulations.

The trends that we are seeing here in Singapore also reflect the global trends that we would expect to see in other advanced centres. There is going to be a shift to these newer fields – for example, the possibility of females postponing childbirth through cryopreservation of their eggs.

### Tell us a little about your recent move from the public sector to private practice.

At the end of 2003, I left NUS and started the eighth IVF centre in Singapore, which provides clinical services at the O&G Partners Fertility Centre in Gleneagles Hospital. I am the director of the centre and I work there with two other clinicians, Dr Jothi Kumar and Dr LC Foong. The IVF laboratory, which is a key part of operations, is called Embryonics International, and is staffed by expert embryologists who moved with me from NUS; my chief embryologist and laboratory manager is Dr SL Liow, whom I supervised for his MSc and PhD. I was very happy at NUS, but after some recent changes, I felt it was time to start a new venture, a new challenge. However, I still work closely with the university in research and teaching – I hold adjunct professorships at both NUS and Nanyang Technological University (NTU). One drawback of private practice is that we are no

longer eligible for research grants – these are only available to principal investigators who are full-time staff of the university. But maybe that will change in the future.

### On a more personal note, how did your interest in bird watching develop?

While doing national service, I was stationed in the South China Sea as a medical officer in the navy. I had a lot of spare time and spent much of it observing the migratory birds. In fact, one of my earliest publications was on the behaviour of migratory barn swallows in the South China Sea. Also, when I was a medical house officer, there was a very active bird study group, which at that time was made up of members of the British army. I accompanied them on some of field trips and found it very interesting. Many of the members were leaving Singapore and I just continued their work. I have been doing 'bird things' ever since.

### What are your favourite birds?

My favourite birds are the hornbills, and also kingfishers and pittas. I'm currently involved in a project called The Singapore Hornbill Project with NTU students. We are observing the hornbills' behaviour in the wild via video cameras that we have set up in their nests on Pulau Ubin, a small island north of Singapore.

### What is the rarest bird you've seen?

The rarest bird I've seen is called a Gurney's Pitta. It is one of the world's rarest birds and I saw it in a trip to Krabi in Thailand. At that time, there were thought to be only 30 pairs left in the world, and they were all in a very isolated forest on Krabi. That sighting was really exciting for me. Fortunately, since then they have found more Gurney's Pittas in new areas in Myanmar, so it is not as threatened as we once thought.

### What are the best places to go bird watching in Singapore?

The best places for bird watching of course depend on what types of birds you want to see – there are a number of good places in Singapore. Sungei Buloh Nature Park is good for mangrove birds, waders and migratory birds. Pulau Ubin is also a good area, as are some of the central catchment areas around the reservoirs, and Bukit Timah Nature Reserve. But I normally go up to Malaysia to bird watch – although I don't do it nearly often enough. I hope I will have more time in future for bird watching as I'm almost semi-retired already! ❖