IN brief

Blood test for Down syndrome

A noninvasive prenatal test for Down syndrome and other fetal abnormalities has been launched by Verinata Healthcare, of Redwood City, California, for use by clinicians in the US. The genomic test called verifi uses maternal blood and massively parallel sequencing to identify telltale chromosomal abnormalities in circulating cell-free fetal DNA. Steve Quake, a professor at Stanford University's School of Engineering, whose laboratory generated the technology upon which verifi is based, says he hopes the test will one day replace more invasive procedures like amniocentesis and chorionic villus sampling, which confer a risk of miscarriage. A recent study of 2,882 patients using verifi showed 100% specificity and sensitivity for trisomy-21; the assay also reliably detected other chromosome number problems including 18, 13, 20, 16, X and Y. The assay is very similar to the MateriniT21 test launched late last year by San Diego–based firm Sequenom, and indeed, a patent-related legal dispute is pending between the two companies. Other companies have tests on the horizon. Stephen Brown, a reproductive geneticist at the University of Vermont, as well as a physician who uses MateriniT21 in the clinic, says that the science behind the Sequenom and Verinata tests is "indistinguishable." Having studied the patent involved in the dispute, Brown doesn't think a lawsuit will stop either company from carrying on. What will tip the market, he says, will be the usual mundane factors: customer service, turnaround time and price. *Jennifer Rohn*

Industry trial bias refuted

A new report concludes that industry funding does not skew trial outcomes, at least for rheumatoid arthritis drugs. Rheumatologist Nasim A. Khan and collaborators at the University of Arkansas for Medical Sciences in Little Rock identified 103 randomized controlled trials of drug therapies for rheumatoid arthritis registered at ClinicalTrials.gov (*Arthritis Rheum.* published online, doi:10.1002/art.34393, 24 January 2012). The authors found that trials sponsored by nonprofit organizations such as the National Institutes of Health or the Arthritis Foundation were statistically just as likely to reflect positively on the experimental drugs as those sponsored by biopharma companies. Although industry-run trials tend to be shorter, they enroll more patients at more centers. Their focus may also favor experimental drugs, whereas nonprofits largely compare established drugs and strategies. Khan also found that industry-funded trials are better on some quality measures such as double blinding. The group's conclusion, however, counters results from meta analyses of randomized controlled trials across different disciplines where industry input is associated with an increased likelihood of favorable results, notes Sergio Sismondo, who studies the nature and distribution of pharma research at Queen's University in Kingston, Ontario. "Our study—which is a relatively small study, in a very focused area—is probably not universal," Khan notes. *Josh P Roberts*

Fifth time's the charm for infant respiratory distress drug

A company's drawn-out struggle to gain approval for a peptide therapy treating respiratory distress in preterm infants came to a close on March 9. After four previous submissions over the past eight years, the US Food and Drug Administration (FDA) finally approved Surfaxin (lucinactant), manufactured by Discovery Labs in Warrington, Pennsylvania.

Surfaxin is a synthetic, liquid formulation containing sinapultide (KL4), a novel 21-amino-acid peptide, designed to mimic the function of the critical human surfactant protein, SP-B. Its discovery stretches back to the late 1980s, when immunologist Charles Cochrane, one of the five founding members of the Scripps Research Institute in La Jolla, California, analyzed the proteins in a substance called pulmonary surfactant taken from a baby's lungs. Surfactant, produced in the alveoli, reduces surface tension throughout the lungs, thereby regulating their function.

Nasser Nuri / Reuters

Surfaxin treats respiratory distress in preterm neonates.

Babies born before the twenty-eighth week of gestation, however, don't make enough surfactant, causing a life-threatening condition called infant respiratory distress syndrome (IRDS). Surfactant consists of phospholipids plus four proteins. One of those proteins, surfactant SP-B, combined with phospholipids produces full surfactant activity, Cochrane found. The key to SP-B function is the order of positive and negative charges in its amino acid sequence. So he synthesized a 21-residue peptide alternating a lysine (positive) and four leucines (negative). "That plus the phospholipids made the perfect surfactant," Cochrane says.

Cochrane founded Discovery Labs to develop the product in 1992, just as animal-derived surfactants were hitting the clinic and changing the standard of care for IRDS babies. Three of those products—Survanta (beractant), Infasurf (calfactant) and Curosurf (poractant alfa)—are still staples of neonatology units, with a global market value of $200 million. But Discovery Labs management believes Surfaxin can galvanize the market. Because of potential immunogenicity, animal-derived surfactant products can be administered just once, which is enough for most babies with IRDS. But repeat dosing may be required to treat other diseases. As Surfaxin is completely synthetic it avoids any potential risks associated with therapies of animal origin. Last year, Surfaxin was granted orphan drug status in Europe for cystic fibrosis.

Another advantage to Surfaxin is the potential for a new type of delivery. Current surfactants, including Surfaxin, must be administered through an endotracheal tube, which can scar lung tissue and cause chronic lung disease. In February, Discovery Labs received registration and FDA clearance for its aerosolized drug delivery system, AFFECTAIR. The company is completing tests of aerosolized Surfaxin in pre-term lambs and plans to take th products into clinical trials next year. Because it is a synthetic peptide, Surfaxin is a sturdier molecule and more amenable to being aerozolized than the animal derived products. "By reducing the invasiveness of delivery, we can expand the surfactant-eligible patient population, both within the diagnosis of IRDS and beyond," says Tom Miller, the company's COO. No pricing has been announced for Surfaxin, but Miller notes that the cost of the animal-derived products, about $450 per vial, undervalues the benefits surfactants provide.

Surfaxin was first submitted for FDA approval in 2004; in early 2005, the agency deemed the drug approvable but asked the company to develop an assay that examines the drug's activity in another biological system. "The former management team said it wasn't necessary and they just didn't do it," says Tom Amick, Discovery Labs' CEO. The fourth rejection by the FDA, in 2009, spurred a management and staff overhaul during which the then-CEO quit. "The derivative benefit" of the drug's regulatory travails, says Miller, is that the agency is now very familiar with the drug and the company's follow-on plans.

It's impossible to predict how strongly neonatologists will embrace Surfaxin, says Thurman Merritt, a neonatologist at Loma Linda University Children's Hospital in California, who worked with Cochrane on the very first iteration of the peptide. But what's truly unique about the drug, he says, is that it may be the first of many "designer surfactants" that could treat a wide range of indications. "It may well be that not one surfactant is good for all diseases."

Alla Katsnelson *New York*