



Christian Sardet

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Christian Sardet says he is old enough to remember cell biology meetings before the invention of the poster. “There were thousands of these little five-minute talks,” Sardet recalls with a shudder. “Then came the poster session and it was a revolution.” But now a new revolution is needed in the way science is presented, says Sardet, and he doesn’t mean more PowerPoint slides.

Sardet studies the role of calcium pulse signaling at fertilization in controlling the cell cycle and embryonic polarity. He leads the BioMarCell group at the Station Zoologique, Villefranche-sûr-Mer, a historic marine research station on the Mediterranean that is supported by the French national research agency, the Centre National de la Recherche Scientifique (CNRS), and administered by the Université Pierre et Marie Curie in Paris. Outside of molecular and cellular embryology, Sardet is best known as a tireless agitator for cell biology to go visual, to go public, and to go online.

In 2001, Sardet started the Cinema of the Cell video contest at the joint European Life Scientist Organization (ELSO) and French cell biology society (SBCF) meeting in Nice and established a site called BioClips to webcast the best films ([www.bioclips.com](http://www.bioclips.com)). The selected shorts on BioClips are a mixture of scientific sobriety and whimsy. The 2004 winner, *Twisted Sisters*, by Alex McDougall and colleagues, features stunning computer-enhanced video of homologous chromosome separation plus a heart-throb soundtrack of an old Jacques Brel torch song, “Ne me quitte pas” (“Don’t Leave Me”). The result is both funny and beautiful. Somehow, the computer animators got the chromatid ends to wave good-bye tragically. For *Marius Explores the Cell*, a cartoon about organelles that is squarely aimed at kids, Sardet himself provided the voice track of Marius, a friendly virus inhaled by the sleeping Fabrice. (“He’s human,” says the virus, “and a little complicated.”) Cinema of the Cell will return this September at the 2007 ELSO meeting in Dresden, and Sardet is expecting a new crop of BioClips submissions.

### Seeing the Real Thing

Off the Web, Sardet has been making biology films since the mid-1980s. In 2006, with backing from CNRS Image Production, Sardet and

Véronique Kleiner made *Exploring the Living Cell*, a conventional, put-it-in-the-player, 180-minute DVD featuring lab visits with leading researchers including Paul Nurse, Kai Simons, and Eric Karsenti. Reviewing *Exploring the Living Cell* last June in *Nature Cell Biology*, Thoru Pederson singled out a novel use for the DVD in wooing donors. Pederson wrote that when addressing lay audiences “for eleemosynary purposes,” words go only so far. “There comes a point when the layperson just has to see the real thing. One can troop a small donor group into the lab, but for larger audiences, some of the segments in this DVD will be terrific,” Pederson continued. In fundraising for “our glorious profession,” according to Pederson, is “where this attractive DVD may have its greatest ultimate value.”

Stanford University’s David Epel says that Sardet’s strong aesthetic sensibilities have always made him stand out in their field. “Christian just revels in beautiful images of science,” says Epel. He remembers a Sardet platform talk on pronuclear movement in ctenophores (comb jellies). The work was great, Epel recalls, and the visuals were stunning. “Christian is captivated by movement within cells. He’s drawn by aesthetics to these beautiful movements in phenomena, but then he goes on to find out fundamental things about what’s going on in early cell division, axis determination, and polarity.”

Epel’s favorite Christian Sardet story comes from Sicily when the two were team-teaching a summer short course there. “Christian and I were walking in the streets of Palermo. There was an ice cream cone upside down on the street, melting and making this little pattern around it. And Christian said, ‘Ah! Street art!’”—proof, Epel believes, that, “Christian is someone who sees art and beauty in the biological world and in the real world.”

### Microscopes and Jimi Hendrix

If Christian Sardet is a biologist with the eyes of an artist, he is also a Frenchman who is almost a one-man trans-Atlantic bridge. Sardet was born in Melle, a village in a still-rural region of western France near Poitiers. Sardet grew up fascinated by microscopes and the wonders they revealed in pond water. His fascination with things American came from late-night radio.

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“Every night at 10:00 pm, there was this show that had all this fantastic jazz,” Sardet explains. “This was also the beginning of rock ‘n’ roll, and so from the radio I knew about the Beatles and Jimi Hendrix.”

After taking a degree in biochemical engineering in Lyons, Sardet took off for the States in 1968. (“So I missed all that stuff in France,” he says, about “les événements de mai,” the student strikes and government crackdown that marked his university contemporaries at home.) Sardet was bound for Philadelphia, where he found his first U.S. post as a lab technician for George Rothblat at the Wistar Institute. In Philadelphia, Sardet got a second author credit on a paper about cholesterol uptake and a push toward graduate school from Rothblat. Sardet also met his wife-to-be, Dana Rosen, then a Bryn Mawr undergraduate. They married in 1970. She is a filmmaker who has worked on projects in both France and the U.S. Their two sons, Noë, 28, and Nico, 27, who are both computer graphic and multimedia designers, have dual citizenship. Nico lives in San Francisco and Noë is moving to Montreal.

Christian Sardet’s other American connections include his 1972 doctorate in comparative biochemistry from University of California, Berkeley, where he did his thesis with Rosemary Ostwald on cholesterol exchange between plasma lipoproteins and red cells. Sardet was back in California in 1983 for a sabbatical year at Stanford University’s Hopkins Marine Station. After that, Sardet was a summertime regular at the Marine Biological Laboratory in Woods Hole. He also served as a “scientist-in-residence” at the San Francisco Exploratorium when he worked on its interactive imaging installation. And despite all those pre-poster, five-minute talks, Sardet has been an ASCB member since graduate school.

## A Career at Home

Although his American connections are strong, Sardet made his scientific career in France. Besides his leadership of the CNRS cell biology unit at Villefranche, he was the president of the French cell biology society from 2000 to 2003 and the local organizer for the 2004 and 2005 ELSO/SBCF meetings in Nice. He also serves on a long list of French and European academic advisory committees.

Sardet admits that it took him a while to find his research focus. On his return to France, his first postdoctoral post was with Vitorrio Luzzati at the Center for Molecular Genetics, a CNRS facility in the Paris suburb of Gif-sûr-Yvette. The emphasis there was on biophysical

approaches to receptor protein structure. His work on bovine rhodopsin sparked his interest in membrane dynamics, Sardet recalls. “I got a good sense of the three-dimensionality of macromolecules while I was in Gif.” But his true scientific calling arrived in 1975 on the back of a holiday postcard. It was from a British postdoc in the Luzzati lab who was vacationing on the Côte d’Azur. He’d written to tell Sardet that he’d been walking on the beach at Villefranche when he ran into someone from the marine station there, “who was looking for someone just like you.” It was Jean Maetz, a fish physiologist studying the cellular mechanisms that govern fresh-to-saltwater adaptation. Maetz needed a biochemist with a strong cell biology slant to look at chloride permeability in fish gill epithelium. This was indeed someone just like Sardet.

Sardet had little notion of the marine station’s history when he first went to Villefranche in 1976. The main building started life as a naval arsenal for the Kingdom of Savoie and was used as a prison for captured Turkish galley slaves. In science history, it was where Hermann Fol, the first to witness the penetration of a starfish egg by sperm, started a scientific station to more fully explore marine embryos. (Fol disappeared under mysterious circumstances on a collecting trip off the coast of Libya in 1891.) Maybe Fol’s ghost was an influence, but at Villefranche Sardet’s interests moved from chloride permeability in fish gill epithelial cells to chloride permeability in sea urchin eggs. From there, the study of fertilization was a logical step.

## Echinoids, Protists, and Tunicates

The 1980s were an exciting time in embryonic physiology as new molecular and imaging tools revealed free calcium as a driving force in embryonic activation, cell cycle control, and differentiation. Much of this work was done in the humblest of marine creatures, including sea urchins, protists, and tunicates, but the excitement doubled with the discovery that the pathways elucidated in lower organisms are highly conserved and have analogs in mammalian embryonic development. In 1985, Sardet became chief of a new CNRS marine cell biology unit at Villefranche that focused on fertilization, the role of calcium in sperm motility and chemotaxis for setting axis polarity and shaping the cell cortex.

Sardet says he was influenced by Lewis Tilney’s visit to Villefranche and his sabbatical work with David Epel and Dan Mazia at the Hopkins Marine Station. He also cites his summer work on ascidian eggs with Lionel

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Jaffe and Annelies Specksnijder at MBL, where they discovered calcium wave pulsing during meiosis. But the man who first converted him to ascidians, according to Sardet, was a Croatian scientist visiting at Villefranche, Marko Zalokar. Ascidians, which are commonly called sea squirts, belong to the most distant evolutionary group that still shares several common chordate characteristics with vertebrates. “In fact, it has been shown recently by Delsuc and Chourrout [Delsuc et al. (2006). *Nature* 439, 965–968] that they are our most direct invertebrate ancestors,” says Sardet. “Much of what we’ve learned about calcium signaling [in ascidians] has turned out to have direct application in mammals. It is the perfect model for exploring my present interests in how embryonic axes are set up and in the structure and role of the cortex.”

### An Extraordinary Resource

Aside from the oceanfront scenery, one great advantage of working in a marine research station is that you can shop around for model organisms. Sardet has worked on a long line of marine creatures from sea urchins to ctenophores to chaetognaths (predatory marine worms) to

the abundant planktons along the coast near Villefranche.

Sardet has put his marine location to prime scientific use, says Michael Whitaker, a physiologist at Newcastle University in England who has collaborated with Sardet and has visited the station many times. “Christian has developed an extraordinary biological resource at Villefranche that he’s been using to look at a range of different subtle physiological phenomena related to development in a number of different marine species.” According to Whitaker, “Christian is the most zoological of the physiologists who work on fertilization. He’s the person who has the broadest understanding of the diversity and variety in marine organisms.”

Sardet is also the person with the broadest understanding of the power of images, declares Whitaker, who was in the audience at ELSO for the 2005 session of Cinema of the Cell. An excited crowd packed the large auditorium to overflowing, Whitaker remembers. “The people who’d entered obviously put a lot of effort into their films. It was brilliant.” ■

—John Fleischman

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