

=== ORAL PRESENTATION ABSTRACTS ===

How to win a Nobel Prize: stumbling on the secret of cell division

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I grew up in Oxford wanting to be a scientist, loving gadgets and processes like melting lead pipes or electrolyzing salt solutions to make poisonous and explosive gases. Luckily, I had excellent teachers who channeled these enthusiasms into a deeper and more formal understanding of chemistry and biology (physics, alas, was beyond my grasp) so that it was possible to study at Cambridge University and carry on there with a Ph.D. in biochemistry, on the business of the control of haemoglobin synthesis. I'll explain how I arrived at this—it was an accident—and also where I pursued the subject. It took ten years, many interesting side roads, a lot of travel and a devastating fire to solve the problem of how the synthesis of haem was coordinated with the synthesis of globin.

After that, it took another 7 years or so to find a really good new problem to work on, but on July 22nd 1982 I was teaching and researching at the Marine Biological Laboratory, Woods Hole, and saw to my amazement that a prominent protein, later called cyclin, disappeared just before fertilized sea urchin eggs divided for the first (and every subsequent) time they divided. Finding out what this protein was, and what it did, took another six or seven years of very exciting work, leading away from the control of protein synthesis to the control of cell division. Yet amazingly, the underlying mechanisms were identical, involving a class of enzymes known as protein kinases, which attach phosphate residues onto other proteins, thereby modifying their behavior. I've always liked biological switches and finding how they work.

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Most recently, however, I've been drawn to the study of the enzymes that remove phosphates from proteins and their control, which turn out to be very important in the switches that initiate and terminate cell division. The path was marked by unexpected discoveries all along the way, almost always stemming from sensible experiments designed to test something different!