

## DEVELOPMENTAL TWISTS

# The Time Machine

Tsuku Mogami

I'm 70 this year. Can you believe it? 70! Seems like only yesterday I first met Aden. I knew we were made for each other the moment our arms locked. Our matchmakers should get credit for that.

Aden's going to be 70 this year too. We were born in the same month in the Cavendish workshop, Cambridge. From there we migrated, together with other newborns, to the office of James Watson and Francis Crick, who paired us up. We looked magnificent lined up in double-helical formation with the other couples. Visitors were ushered in to admire our spiral pose. They gawped while congratulating our matchmakers on their intellectual tour-de-force, for as Watson and Crick were to write in their classic paper, their structure 'rests mainly though not entirely on published experimental data and stereo-chemical arguments'.

I was nine when our matchmakers were awarded the Nobel Prize. That year we moved to a newly constructed laboratory, the Laboratory of Molecular Biology, on the outskirts of Cambridge. We were housed in the communal model room. People lost interest over the years and we grew a thick skin of dust. Some of our companions began to drop away. Finally, I was torn from Aden as the coils were dismantled. Aged 15, Aden and I found ourselves packed up in a box of spare parts and sent off with crystallographer Herman Watson to Bristol.

In the same year, 1968, James Watson published *The Double Helix*, which told the story of how I came into being. It seems that before I was born, he and Crick had proposed a triple helical formation, with a backbone on the inside. Euphoric, they had informed their colleagues, including their boss, Sir Laurence Bragg, that the elusive DNA structure had been solved. But when Rosalind Franklin, who Watson considered obstructive and narrow-minded, saw their proposed arrangement, she was quick to point out it couldn't possibly be correct – too little water. An unpublished X-ray picture from Franklin's student, Raymond Gosling, set them on the right path.

A few years after publication of *The Double Helix*, I was reunited with Aden. Ann Newmark from the London Science Museum discovered us, along with other survivors of our birth group, when visiting Herman Watson in Bristol. A plan was hatched for a reunion. We were to be reassembled and exhibited in the museum, to help to transport museum visitors back to those first moments of discovery. In 1977, aged 24, our reconstruction cast its shadow of spidery hexagons and pentagons once more. We've been assisting with time travel ever since.

I must admit I've become a little obsessed about my past. Occasionally new insights surface. Ten years ago, Raymond Gosling, the student who took the X-ray picture, was interviewed. He said how Franklin positively relished pointing out the errors in Watson and Crick's first structure, the triple helix. Gosling's interviewer suggested that Watson's negative portrayal of Franklin could have been payback for this moment. 'Yes', said Gosling. 'Oh, I'd never thought of it, but yes, that's true. The humiliation. He must have felt – that's the word – he

must have felt humiliated. Who the hell is this woman, telling me...Yes, you can see it more clearly looking back, can't you?'

Aden wasn't surprised by Gosling's words: "I always suspected Watson was angry with Franklin for puncturing his pride".

"What made you think that?", I asked.

"In his book he wrote how, a few months before we were born, Linus Pauling, who he considered 'unquestionably the world's most astute chemist', proposed a triple helical structure for DNA. He wrote of Pauling's error: 'if a student had made a similar mistake, he would be thought unfit to benefit from Cal Tech's chemistry faculty'. He was as derisive of Pauling's triple helix as he must have felt Franklin had been of his. Belittling an intellectual giant made his own mistake more excusable. And remember how Watson described Franklin's reaction when she first heard about our double helical form: 'Rosy's instant acceptance of our model at first amazed me...her fierce annoyance with Francis and me collapsed...Obviously affecting Rosy's transformation was her appreciation that our past hooting about model building represented a serious approach to science, not the easy retort of slackers who wanted to avoid the hard work necessitated by an honest scientific career'. Makes you wonder whether it wasn't she who'd been angry with him, but he who'd been angry with her."

"I don't get it", I said. "Shouldn't we welcome being put right; thank those who correct us? I'm more than happy to accept criticism."

"Of course, dear."

"And if Watson was so concerned about looking clever, why did he write a book contradicting himself? By revealing the vital part the X-ray photo played, he undermined his earlier claim that unpublished data played only a minor role in the discovery."

"Maybe he didn't see the contradiction. Believing Franklin to be aggressive and blinkered may have allowed him to feel justified in minimising the importance of her data in his publication with Crick. She died before his book came out, so she never knew how crucial her and Gosling's contribution had been."

Aden and I now live surrounded by retired metallics: a V2 Rocket, a stack of popular cars topped by a Fiat 600, a JET1 gas turbine car and a Rolls-Royce Merlin engine that once powered Spitfire aircraft. And hovering above us, like a colossal bird of prey poised to swoop, the Lockheed Electra, the plane Neville Chamberlain took to negotiate peace with Hitler.

The time-travellers are about to be let in. I do hope they'll be kind. Not like that traveller from a few days ago who was keen to point out an error in our helical formation to his companion: some of our couples should be holding each other with three arms not two.

"What a jerk!", I said to Aden, after the traveller left.

"But he's right. Watson and Crick got that part of the assembly wrong."

“Yeah, but he didn’t have to rub it in.”

Hopefully they’ll make a fuss over me on my 70th. And why not – I’m proud to have played even a small part in such an amazing discovery.

**Postscript**

The quotes from Raymond Gosling are taken from ‘Raymond Gosling: the man who crystallized genes’, an editorial in *Genome Biology* by Naomi Attar (<https://rdcu.be/c1WwY>).

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