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Obituary

The Greatest Cytogeneticist—Comparatively

Darren K. Griffin ^{1,2,3}

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Malcolm Andrew Ferguson-Smith (born 5th September 1931 and pictured here (Figure 1) in 2014) sadly passed away on 4th February 2026.



Figure 1. Malcolm Ferguson-Smith at the 20th International Chromosome Conference, Canterbury, 2014, where he gave a plenary lecture on comparative genomics (author's personal collection).

Malcolm was one of the original cytogeneticists and a pioneer of comparative genomics. He was born in Glasgow and graduated from the university of the same city with a medical degree in 1955. He subsequently won a prestigious fellowship to attend Johns Hopkins



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University from 1959, where he was one of the first to work on human chromosomes. After returning to Glasgow in 1961, he progressed through the academic ranks, becoming a Lecturer, Senior Lecturer and Reader, before being appointed Burton Professor of Medical Genetics in 1973. In 1987, he moved south to become Professor and Head of the Department of Pathology at the University of Cambridge. During his time at Cambridge, he balanced roles as the Director of the East Anglia Regional Genetics Service and, later, a scientific member of the Bovine Spongiform Encephalopathy (BSE) Committee. Reporting in 2000, this committee considered the worrying emergence of the new variant of Creutzfeldt–Jakob disease (CJD). He was an Honorary Consultant in Medical Genetics, Addenbrooke’s NHS Trust, Director of the Cambridge University Centre for Medical Genetics (1989–1998), and awardee of the San Remo International Prize for Genetic Research (1990), the Makdougall Brisbane Prize (1998) and the Mauro Baschirotto Award (1996). He was an Honorary Associate of the Royal College of Veterinary Surgeons (awarded in 2002), and was elected a Fellow of the Royal Society of Edinburgh (FRSE) in 1978 and a Fellow of the Royal Society (FRS) in 1983. He was also awarded Honorary DScs by the Universities of Strathclyde (1992) and Glasgow (2002).

His largest body of work was in the molecular description and comparative analysis of the karyotypes of numerous species. While balancing his clinical and BSE/CJD roles, as well as his job as Professor and Head of Department, he set up a lab that later became the Cambridge Resource Centre for Comparative Genomics. Following a close collaboration with Nigel Carter, a flow cytometer was set up to isolate individual chromosomes of many species. After whole genome amplification and fluorescent labelling, flow-sorted chromosomes could be turned into chromosome paints. Cross-species chromosome painting (or “zoo-FISH” as it was called) using paints from species A could be applied to the metaphases of species B to establish the evolutionary relationships between them. While many groups were doing this with commercially available human chromosome paints, it was Malcolm’s lab’s ability to make and take chromosome paints from species B and apply them to species A that was unique [1,2]. As shown in Figure 2, this meant that all the genomic syntenies between the two species could be established. Such work was essential in linking genome structure (as expressed in a particular species’ karyotype) with the rapidly emerging field of whole genome sequencing and assembly. Harris Lewin once said “Every good genome needs a map” [3]—that map started with the karyotype (often constructed by comparative genomics), and Malcolm’s work was essential in establishing that.

Many scientists passed through his doors (myself included), and it would be inappropriate to try to name them all. The list would be prohibitively long, and inadvertently causing offence by leaving someone out would be inevitable. I will make one exception, however, as the ratio of her actual contribution to Malcolm’s work compared to the recognition that she received has often been left underappreciated. Patricia (Trish) O’Brien was a stalwart of Malcolm’s lab for many years. She was responsible for flow-sorting all the chromosomes and was often the sage, counsellor, diplomat, shoulder to cry on, and all-round good-humoured friend that held the lab together on multiple occasions. I know that she will miss Malcolm more than most.

Following his stepping down as Head of Pathology in 1998, Malcolm moved to the University of Cambridge Department of Clinical and Veterinary Medicine (“The Vet School”), where he and Trish set up the flow cytometer once more and continued their work on comparative genomics. Thus, the Cambridge Resource Centre for Comparative Genomics was born in earnest (in around 2002), which was still going strong in 2020. Thousands of probes, cell lines and metaphases now exist from mammalian, avian, reptilian, amphibian and fish species, making it the largest cross-species molecular cytogenetic hub in the world. Malcolm always encouraged the melding of different scientific traditions with

the free exchange of ideas. As such, many long-term collaborations ensued to create a huge international network. Estimates suggest that this led to over 650 high-impact publications with, to date, nearly 40,000 citations. This unique and vital resource has since been housed at the “CryoArks” facility at London’s Natural History Museum.

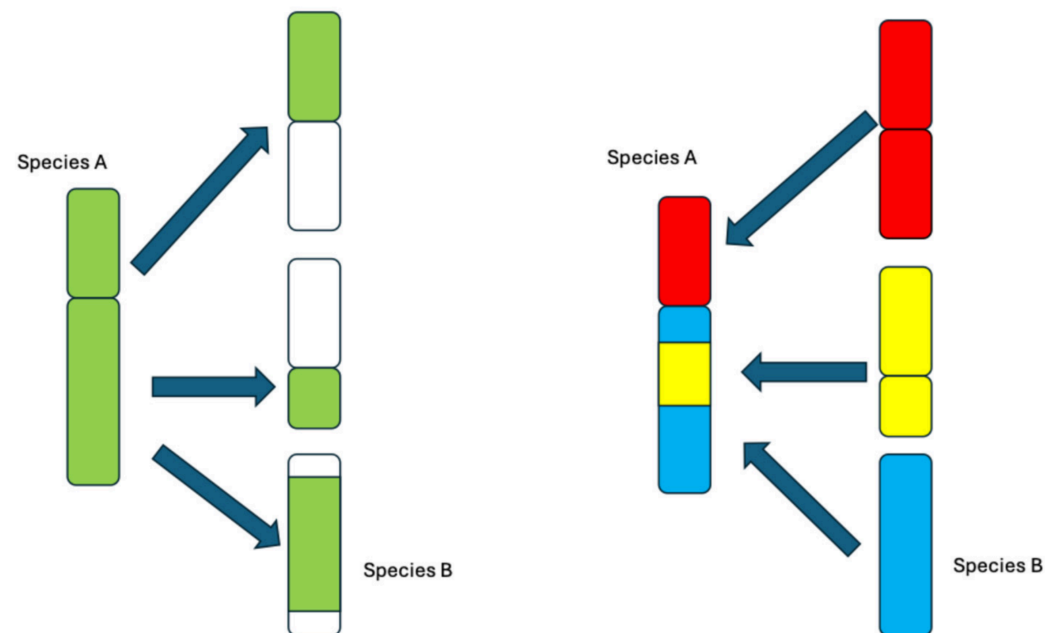


Figure 2. Reciprocal chromosome painting—the Ferguson-Smith approach to comparative genomics. By applying chromosome paints from species A to the metaphases of species B, limited syntenic information can be established. Only by applying chromosome paints from species B to the metaphases of species A can all the comparative syntenies between the two species be established. By doing this on more than two (and frequently multiple) species, the direction of chromosome change can be established [1,2].

For me, Malcolm was a leader, a mentor and a friend. He would always have a word of encouragement and advice to help me springboard my career. He was always available to give a plenary lecture and was immeasurably kind to my students and staff, who, we often joked, were his “academic grandchildren.” It was never a bad thing to have such a famous ex-supervisor to whom to introduce them. We shared a great love of cytogenetics of course, but also of team building, of networking, of bringing the scientific community together and of enthusiastic (but perhaps not entirely tuneful) singing at conference dinners. Malcolm survived his beloved wife and life partner Marie by only a year, and I know he is sorely missed by his children, Anne (Arthur Balfour Professor of Genetics, University of Cambridge), Nicola, John and Julia. Malcolm and Marie had ten grandchildren (Ruth, Max, Kasia, Ellen, Beth, Calum, Megan, Stephan, Findlay, and Anna) and four great-grandchildren (Rory, Harris, Mila and Winnie—with Winnie born only a few weeks after Malcolm’s death). Malcolm’s pride and joy were his family, and he took his responsibility as the patriarch of this genetic legacy so seriously right up to the end. He left this world at his home, surrounded by those he loved. He was engaging in conversation, listening to their tales of times past, as well as those of the whole of the genetic community.

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Conflicts of Interest: The author declares no conflicts of interest.

References

1. Ferguson-Smith, M.A.; Yang, F.; Rens, W.; O'Brien, P.C. The impact of chromosome sorting and painting on the comparative analysis of primate genomes. *Cytogenet. Genome Res.* **2005**, *108*, 112–121. [[CrossRef](#)] [[PubMed](#)]
2. Ferguson-Smith, M.A.; Trifonov, V. Mammalian karyotype evolution. *Nat. Rev. Genet.* **2007**, *8*, 950–962. [[CrossRef](#)] [[PubMed](#)]
3. Lewin, H.A.; Larkin, D.M.; Pontius, J.; O'Brien, S.J. Every genome sequence needs a good map. *Genome Res.* **2009**, *19*, 1925–1928. [[CrossRef](#)] [[PubMed](#)]

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