

## Profile

### Giovanni Frisoni: an innovator with his head in the cloud



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"When my kids get up in the morning they look forward to playing with their PlayStation. I look forward to playing with my projects", says Giovanni Frisoni, who was in a suitably playful mood when *The Lancet Neurology* caught up with him in May. His latest game involves developing the cloud-computing infrastructure that will eventually enable researchers to analyse thousands of pooled images of the brains of patients with Alzheimer's disease. Not exactly child's play, but for Frisoni "it's fun, it's a lot of fun". The cloud project is typical of Frisoni's work so far: innovative, ambitious in scope, and truly collaborative—something that Frisoni himself is always keen to emphasise. "All I've done was done with collaborations", he says, "and there's a history behind that."

Now the deputy scientific director of the Scientific Institute for Research and Care (Istituto di Ricovero e Cura a Carattere Scientifico [IRCCS]) at the National Centre for Alzheimer's and Psychiatric Diseases in his home town of Brescia, Italy, Frisoni is most widely known for his pioneering work to standardise the way images are analysed to improve their use in diagnosis of Alzheimer's disease. This is a remarkable feat, considering that he has worked for the past two decades in an ageing psychiatric hospital with precious little in the way of imaging technology. "To do imaging research I've always had to set up collaborations with all sorts of people. First in my city, then in my region, then in Italy, and then all over the world", he explains.

"He has always had an enormous drive and lots of energy", says Philip Scheltens (director of the Alzheimer Centre, Vrije Universiteit Medical Centre in Amsterdam, Netherlands), who has known Frisoni since the early 1990s and worked closely with him in the early days of the European Alzheimer's Disease Consortium. That sentiment is echoed by Charles DeCarli (professor of neurology at the University of California, Davis, CA, USA), who lauds Frisoni as "one of Europe's leading neurologists in the area of Alzheimer's disease research...and a delight to work with". Drive and energy certainly help when it comes to instilling a sense of purpose to a collaboration, but, Scheltens explains, Frisoni has another rare gift: "He proved to possess the required EU [European Union] gene that is needed to obtain funding" (€5 million in the past 2 years alone).

He has certainly always had a head for figures. Growing up, Frisoni was always top of the class, partly by necessity. With a mother who was a primary school teacher, "there was no choice", he laughs. "After 5, 10, 15 years it becomes engraved into your brain and you can't get rid of

it." But that is not to say he was not a willing pupil: "I've always liked studying. My pastime when I was a kid was reading...when I was a kid I was dreaming of becoming an astronomer, or a chemist."

After sailing through scientific college, Frisoni headed to medical school at the University of Brescia almost by mistake. "I came from a family where we were not professionals, so I was not exposed to the life of doctors and lawyers; I did not really have a clear idea of what being a doctor meant." Nevertheless, he wanted work that would allow him to be independent, and he felt that medicine fitted the bill. "In my very naive idea", he laughs, "I wanted to be a doctor to be free."

It was at the end of medical school that Frisoni had his first brush with neurology, under the stewardship of the neuropsychologist Luigi Vignolo. He was instantly drawn to it because, he says, neurology "was the most mathematical" of all the disciplines he had studied. "I forgot everything about freedom and medicine...I started studying neurology because I loved it", he enthuses.

He never looked back. In 1991, 1 year after joining the research group of Marco Trabucchi, the former president of the Italian Geriatric Society, Frisoni "happened to be in the right place at the right time" and became one of the founding staff neurologists of the Alzheimer's unit at IRCCS, where he has been ever since.

Now in his 20th year at the clinic, he still has the same enthusiasm and love for neurology that he had as a student, but so much else has changed. "When I started 20 years ago, the first body part that I saw of my patients was very often their feet; because they were so advanced they were bedridden—they were taken to my office on a wheel bed", he explains. "Now I see patients complaining of memory problems dating from 6 months, 3 months sometimes."

This change in societal sensitivity to Alzheimer's disease has been crucial, because patients with early stage disease have opened the way for the development of more modern diagnostic approaches, such as biomarkers. Frisoni's other major collaborative project is to standardise biomarkers for early diagnosis and, in turn, accurate biomarkers will be crucial for drug discovery in Alzheimer's disease—a subject that moves Frisoni. "I would be very unhappy if I retired and still an effective drug was not on the market", he says. "The more we study Alzheimer's disease, the more we understand that it's a very complex disease. I have hopes, but I'm afraid. But this [fear] is more about feelings and emotions."

David Holmes