

Parkinson's disease: Nature, nurture or bad luck?

Scientists have long known that genes alone cannot explain why some people get Parkinson's and others don't. While a handful of genetic mutations are linked to the disease, about 90 percent of cases of Parkinson's are "sporadic," meaning the disease does not run in the family. And twins, even identical twins, don't usually get Parkinson's in tandem. In one of the largest longitudinal twin studies of the disease, Swedish scientists reported in 2011 that of 542 pairs in which at least one twin had Parkinson's, the majority were "discordant," meaning that the second twin was unaffected. The discordance rate was higher for fraternal twins, who are no more alike genetically than any two siblings. But even identical twins had a discordance rate of 89 percent.

So if genes don't explain most cases, how about the environment? Several environmental factors have been linked to Parkinson's, which has been shown to occur at higher-than-expected rates in, for instance, people who were prisoners of war in World War II. There is also a higher rate in people who live on farms or who drink well water, probably because of exposure to certain pesticides.

But the environmental connection is precisely what makes identical twins Jack and Jeff so interesting. For almost all of their 68 years, they have lived no more than half a mile apart. They have been exposed to the same air, the same well water, the same dusty farm chores, the same pesticides. They built their homes a five-minute walk from each other, on two plots of their father's 132-acre farm in eastern Pennsylvania. And since 1971 they have worked in the same office, their desks pushed together, at a graphic design firm they co-own. All this makes it tougher to explain why Jack developed Parkinson's, while Jeff has not.

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