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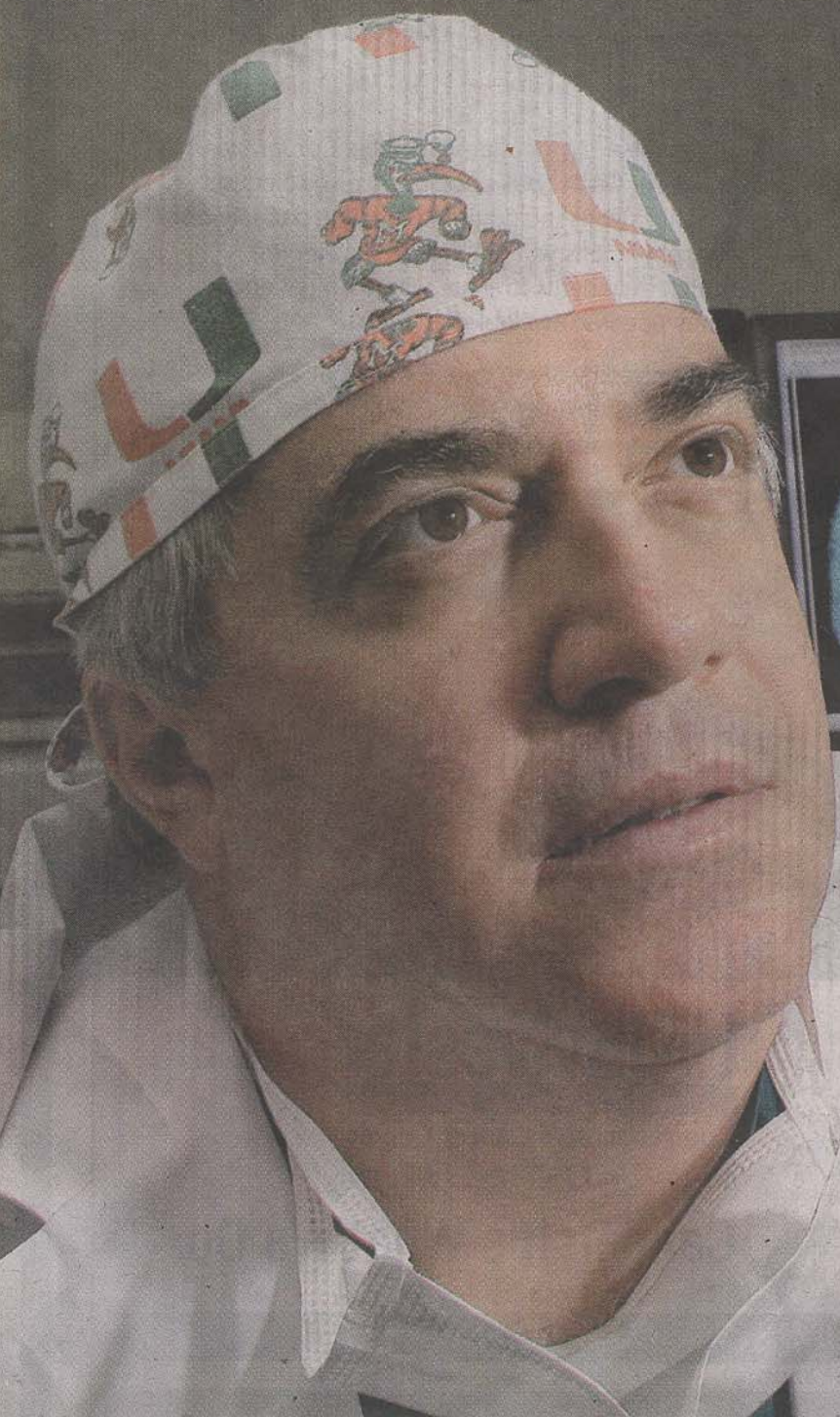
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CAMILLO RICORDI'S MISSION: CURE DIABETES



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Where to begin the story of Camillo Ricordi?

Milan, where he grew up backstage at La Scala theater as the scion of a famous family of music publishers? The mountains of northern Italy, where he stared into the massive fireplace at his family's country estate and had the scientific epiphany that would win him international renown? The University of Miami, where he leads the effort to bring an experimental treatment into mainstream use for hundreds of thousands of diabetics?

Or perhaps, surprisingly, St. Louis, where one Saturday night in 1986 young Dr. Ricordi grabbed a human pancreas out of a trash can to test an invention his colleagues thought absurd.

He put the organ — six inches long, white, shaped like a long tongue — into a machine he built himself, a machine he had previously tested only on pig pancreases bought on early-morning trips to an East St. Louis slaughterhouse.

Ricordi, like the senior scientists who ran his lab, dreamed of curing Type-1 diabetes, in which the body attacks itself, destroying the clusters of insulin-producing pancreas cells known as islets. The disease usually begins during childhood and accounts for about 10 percent of the country's 18 million cases of diabetes.

The scientists hoped to isolate islets from the pancreases of organ donors, then inject the cells into diabetes patients and cure their disease.

But they couldn't figure out how to separate the islets from the pancreas. Machines built by Ricordi's superiors — "meat grinders," Ricordi called them — chewed up the pancreas. Ricordi's colleagues laughed at his device, built to chemically digest the pancreas in a chamber and siphon away the islets into a separate container.

His bosses deemed human pancreases too valuable to waste on Ricordi's machine, but the one he took from the trash had been damaged in shipping and was of no use to anyone else.

Ricordi and a lab technician worked late into the night, and the results shocked even Ricordi: his device isolated far more islets than anything anyone had tried before. Within two weeks, the lab had switched over to Ricordi's machine. Today the Ricordi Chamber, as his device is known, is used in labs from Stockholm to Kyoto.

But as often happens in medicine, solving the problem of islet isolation only led

to other problems, and for the past two decades Ricordi has remained among those struggling through one problem after another to make islet transplantation work.

They're getting closer — more patients who get islet transplants are staying off insulin longer. Yet the procedure remains experimental, limited to patients whose diabetes can't be controlled with insulin injections and who find their way into clinical trials at a handful of university medical centers.

This summer, Ricordi, who now runs the University of Miami's Diabetes Research Institute, will lead a multicenter trial that could finally win the procedure FDA approval and bring islet transplantation into widespread use.

"His dedication to the mission is absolute," says Ricordi's lifelong friend Guido Barilla. "He gives himself completely to what he thinks and feels is his role in this life — to give aid to people who suffer."

AIR OF THE OLD WORLD

Ricordi was born in 1957, while his father was in New York during a brief stint running the American arm of the family business.

"The two people in New York who held me when I was baptized were Lennie on one side — Lennie Bernstein, who you know was a conductor, did *West Side Story* — and Earl McGrath, who eventually became president of Rolling Stones Records," Ricordi says.

Even in the drab surroundings of a windowless UM conference room, a BlackBerry clipped to the blue scrubs that cover



CHUCK FADELY/HERALD FILE

LAB IS HIS WORLD: Above, Dr. Camillo Ricordi and research associate Dora Berman-Weinberg work with a pancreas earlier this year at the UM's Diabetes Research Institute. At left, Ricordi and Over Cabrerra, right, are continuing the research.

SMART BOX

CAMILLO RICORDI

Born: April 1, 1957, N.Y., New York
Heir to: Casa Ricordi, publisher of the music of Verdi; Rossini and Puccini
Education: MD, 1982, University of Milan School of Medicine, Milan, Italy
Invented: Method for isolating insulin-producing cells used in diabetes treatment
Occupation: Scientific director, Diabetes Research Institute, University of Miami
Family: Lives in Miami with wife, Valerie Ricordi and children Caterina, 17; Eliana, 16; and Carlo, 11

his large belly, Ricordi manages to convey the old-world air of the Great Man. The effect is achieved through a combination of factors: his physical size and thick Italian accent; his aura of both droll weariness and deep knowledge; and his unambivalent sense of historic destiny (he expects to cure diabetes).

He grew up wealthy among Milan's artistic elite, heir to the 150-year-old Casa Ricordi, publisher of Verdi, Puccini and Rossini. He went to concerts and parties, but the life never seemed quite real to him.

"I never considered music publishing as a job," he says. "Everybody was having a blast."

His parents separated when he was 13, and he gravitated toward his maternal grandfather, an engineer and physicist.

"Never gave me a present in his life, but always had one more question," Ricordi

says. "If the Earth to the moon is like Florence to Milan, where would be the sun?"

He finished high school at the top of his class and, influenced by his grandfather, announced he wouldn't enter the family business.

"When I decided instead to go into science, people were saying 'Verdi would roll inside his grave because of this betrayal,'" he says. "Earl would call from New York and say 'Bianca Jagger is in Milan, can you do something with her?' I was trying to study anatomy, I was trying to concentrate on my studies, and I would get these incredible, beautiful creatures thrown my way to try to derail me."

Bianca Jagger notwithstanding, Ricordi persisted, studying first neuroscience, then transplantation. In 1982, the year he finished medical school, his cousin Serena was diagnosed with Type-1 diabetes.

"So then you get this idea, I'm going to cure diabetes in the next two, three years, and then I'll redirect my attention to some other, more global problem," he says. "But it's been taking a little more than two, three years."

THE CHIMNEY FACTOR

He covered the walls of his room with scientific papers on islet transplantation and made a poster to chart out every technique that had been attempted for separating islets from pancreases, a problem that had vexed scientists for 20 years. "One of the things my grandfather taught me was the art of designing fireplaces and how you have to design them a certain way, otherwise the smoke comes back in the room," he says. "So I spent quite a lot of time

*TURN TO DIABETES, 12E

CAMILLO RICORDI'S MISSION: CURE DIABETES

Obsession, sense of destiny drive diabetes researcher

•DIABETES, FROM 10E

thinking about the problem [of isolating islets], looking at this big fireplace we had in this country estate in Lake Maggiore in Strezzo. I look at this big log and I see the smoke particles and — how do you say the *cendere*, the thing when you burn wood — ash — with the flow of the heat going toward the chimney and being sucked because of the aspiration. So the log remains down burning and all the smaller particles combust and go out. So then something clicked.”

His machine would be a sort of tiny fireplace, a chamber built to chemically dis-

solve a pancreas like a fire dissolves a log. A tube would carry the islet cells away from the dissolving pancreas — a chimney sucking smoke. He went to St. Louis to work in the world's leading islet transplantation lab in hopes of testing his idea.

Two years and one discarded human pancreas later, he had his chance. The Ricordi Chamber was quickly adopted worldwide and remains the global standard today.

Ricordi went back to Milan, then to the University of Pittsburgh. There he met Dr. Daniel Mintz, one of the founders of the the UM Diabetes Research Institute, who

was helping to create Pittsburgh's islet transplantation program.

In 1993 Mintz brought Ricordi to Miami as scientific director of the DRI. In the 12 years since, Ricordi has directed a staff that at last count numbered 134, overseen 40 islet transplants and trained countless visiting scientists.

“He just opens his doors and lets people from around the world come in,” says Dr. Tom Eggerman, director of clinical islet transplantation at the National Institutes of Health, who called the DRI one of the three top islet-transplantation centers in the world.

Ricordi has expanded the center's efforts to include research into ways to reduce or eliminate the need for the anti-rejection drugs transplant recipients must take. He has also recruited scientists to study stem cells, which could someday be an unlimited source of islets and allow for islet transplants without organ donors.

On an even more basic level, Ricordi is examining the ultimate causes of Type-1 diabetes. Last week he co-authored a study in the journal *Nature* demonstrating which molecules prompt the body to launch the initial attack that causes the disease.

This research could ultimately help scientists discover how to prevent Type-1 diabetes in the first place — an outcome that would render islet transplantation

obsolete.

For the time being, though, perfecting islet transplantation remains at the center of Ricordi's work.

Eighty percent of islet-transplant recipients now stay off insulin for at least one year. But only a quarter remain off insulin for five years. And patients must take a regime of powerful anti-rejection drugs that cause problems of their own, making the risks of islet transplantation exceed the benefits for most diabetics.

“There has been more progress in the previous five years than in the previous two decades, but it's still not a job we can call done,” Ricordi says. “In the future it should become a procedure where you go in in the morning, out in the evening, back to work the next day.”



CARL JUSTE/HERALD STAFF

PUSH IS ON: ‘There has been more progress in the previous five years than in the previous two decades, but it's still not a job we can call done,’ says Dr. Camillo Ricordi, left, who is working in lab with Over Cabrera.