

BIOGRAPHY ΒΙΟΓΡΑΦΙΑ

Vincenzo Diamare (1871–1966) and the priority for the discovery of the endocrine function of the pancreas (1895)

From 1895 to 1908, Vincenzo Diamare (1871–1966), made innovative studies related to the function of the non-acinar cells of the pancreas, which were described by Paul Langerhans in 1869. Through comparative anatomy and physiology studies, he established their endocrine function and their regulation of glucose metabolism in man. His data were confirmed by E. Laguesse, W. Schulze, E. Sauerbeck, N. Minkowski and many others, including J.J.R. McLeod. When in 1923, the Nobel Prize for Medicine and Physiology was awarded to Frederick Grant Banting and John James Rickard Macleod, his name was neglected. The Nobel committee also neglected not only Charles Best and Bertrand Collip, belonging to the Toronto Group of investigators, but also N. Paulescu, G.L. Zuelzer, S.S. Kleiner and E. Lancereux. Diamare did not protest. Throughout his life, he continued to investigate the topic and at the age of 85 he even contributed a ponderous review (85 pages), thoroughly discussing the ideas of his supporters and opponents without acrimony.

1. INTRODUCTION

In the thesis *Beiträge zur mikroskopischen Anatomie der Bauchspeicheldrüsen*, in 1869, German pathologist, physiologist and biologist Paul Langerhans (1847–1868) described the pancreatic islet, without advancing an hypothesis on their function. Diamare (1871–1966) – a scientist who was born and died in Naples, where he was professor of Histology, General Physiology and Embryology (1923–1944) – was innovative and successful in understanding islet function. From 1895 to 1908, he performed comparative studies in teleosts (mainly in *Lophius*), reptiles, mammals, amphibia and birds, utilising the facilities of the Marine Station founded by Anton Dohrn

(1840–1909) and those at the Comparative Anatomy Institute of the University of Naples.^{1–11} He demonstrated that:

- The cells of Langerhans are epithelial structures different from zymogenic cells and may be considered vascular glands
- These cells produce a granular substance stained fuchsia – which is different from that produced by the zymogenic acinar cells of the pancreas – and is secreted in blood vessels (endocrine function)
- These cells, found in humans and vertebrates, are independent of the zymogenic acinar cells of the pancreas cells

ARCHIVES OF HELLENIC MEDICINE 2020, 37(Suppl 2):53–56
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2020, 37(Συμπλ 2):53–56

F. Russo,¹
M. Russo,²
L.S. De Santo,³
A. Mezzogiorno,⁴
N.G. De Santo⁵

¹Department of Structure Function and Biological Technologies, University Federico II, Naples

²Department of Veterinary Medicine and Animal Production, University Federico II, Naples ³Division of Heart Surgery, University of Campania Luigi Vanvitelli, Naples

⁴Department of Physical and Mental Health, University of Campania Luigi Vanvitelli, Naples

⁵University of Campania Luigi Vanvitelli, Naples, Italy

Vincenzo Diamare (1871–1966)
και η προτεραιότητα
για την ανακάλυψη
της ενδοκρινικής λειτουργίας
του παγκρέατος (1895)

Περίληψη στο τέλος του άρθρου

Key words

Discovery of insulin
Endocrine function of the pancreas
Insulin
Paul Langerhans
Vincenzo Diamare

- The islets of Langerhans have an endocrine function in connection with the metabolism of glucose: hyperglycaemia and diabetes are associated with their inadequate functioning.

2. THE 1923 NOBEL PRIZE IN MEDICINE AND PHYSIOLOGY AND THE MANY MISTAKES OF THE NOMINATING COMMITTEE

In 1923, the Nobel Prize for Physiology and Medicine was given to Frederick Grant Banting –an unknown practicing physician– and to John James Rickard McLeod, Director of the Physiology Department at the University of Toronto, for the discovery of insulin.^{12–14} Charles Best, a medical student, and the Biochemist Bertrand Collip, Professor at the University of Alberta who had been working in the Canadian team, were excluded although Collip had a purified extract. McLeod shared with Collip the money from the Nobel prize, as did Banting with Best. Vincenzo Diamare was not even mentioned but accepted the Nobel Committee's decision calmly. Nicolae Paulescu (Bucharest, 1869–1931) was also not mentioned by the Nobel Committee. Paulescu had started his research on pancreatic secretions in Paris under the guidance of Prof Etienne Lancereaux at Hotel Dieu and of Albert Dastre at the Sorbonne. Lancereaux was the first to provide evidence of the existence of two types of diabetes. Back in Bucharest, Paulescu did significant work on the action of insulin.^{15,16} He was not mentioned, although his studies had been cited by the Canadian Group and he had personally patented insulin (patent no 6254 of the Romanian Ministry for Industry and Trade). Nicolae Paulescu protested, but without result. However, the truth came out and, in 1969, the Nobel Committee admitted the mistake in a letter by Professor Arne Tiselius, President of the Nobel Committee, written to Professor Iahn Murray, vice-president of the British Diabetic Association.^{17,18} The Canadian Group¹² had even quoted Paulescu's paper (but wrongly).¹⁵ The Nobel Committee also failed to acknowledge the work of Zuelzer,¹⁹ Kleiner²⁰ and Lancereaux.²¹

3. VINCENZO DIAMARE'S PRIORITY RECOGNISED

After the prestigious Nobel Prize for 1923 was bestowed to Banting and Best, E. Laguesse wrote to Diamare: "Vous avez donc beaucoup fait preparer la decouvert de Banting!".

W. Schulze in 1901 wrote "Finally for the year 1899 we shall quote the comparative anatomy studies performed by Diamare, who confirmed the presence of the islets in all animals with a pancreas. He identifies their function as typi-

cal of ferments and describes them as vascular glands. I can confirm his findings on the basis of my personal experience, based on studies performed before the publication of his work".²² Ernst Sauerbeck in 1904 in a classical study²³ wrote "Diamare proposed already in 1899 on the basis of comparative anatomy studies the modern theory of the islets, where he sees the islet as an organ that through internal secretions influences sugar regulation". In 1908, N. Minkovski stated "I consider that the merit of Diamare is more important for the development of the doctrine of the hormonal function and the final discovery of insulin".²⁴

The 1923 Nobel Prize Winner John James Rickard McLeod in a famous book on insulin²⁵ wrote "The great majority of anatomists have leaned to the view first expressed by Diamare [1895] and endorsed by Rennie²⁶ and Schafer [Lancet 1905, ii:321] [that the islets are structures distinct from the rest of the pancreas with the specific function of producing and internal secretion. [...] Diamare states definitely that the islets of Langerhans have an endocrine function in connection with glucose metabolism in the body and that hyperglycaemia and diabetes are associated with their inadequate functioning [1905]".

4. COMMENT

Diamare, a great investigator who worked until the last day of his life, was not obsessed by the idea of the lost Nobel Prize. He knew that he had not been supported from Italy. However, he defended his work and debated his priority and continued to investigate the topic until the very end of his life. A great example is the paper *Il Pancreas Endocrino (endocrine pancreas)*, where he discussed the real contribution of his competitors.²⁷ At that time, he was 85 years old.

5. SHORT BIOGRAPHY OF DIAMARE

Vincenzo Diamare (1871–1966) was born in Naples on 3 April 1871. He started his medical studies at the University of Naples and received the MD in 1896. As a medical student, he was an internal fellow at the Anatomy Department of the Faculty of Science and at the Marine Station directed by Anton Dohrn. At the time, A.E. Dziesz, J. Apathy and A. Bethe worked there. Under their guidance, he started work on Cestods. After receiving the MD, he was nominated investigator of the Chair of Anatomy and Physiology. His creativity and productivity were so outstanding that in 1902 he received an invitation to teach Zoology and Anatomy at the University of Camerino. Later, he taught at the Universities of Perugia, Pisa and Siena. Finally, from 1923 to 1942,

he taught –as successor of Vincenzo Paladino– Histology, General Physiology and Embryology at the University of Naples. In 1951, Diamare received the Gold Medal of the Ministry of Education and Science and the prestigious

Feltrinelli Prize from the Lincean Academy in Rome for his studies on the discovery of insulin. He died on 20 January 1966. A street in the quarter of the great hospitals in Naples bears his name.

ΠΕΡΙΛΗΨΗ

Vincenzo Diamare (1871–1966) και η προτεραιότητα για την ανακάλυψη της ενδοκρινικής λειτουργίας του παγκρέατος (1895)

F. RUSSO,¹ M. RUSSO,² L.S. DE SANTO,³ A. MEZZOGIORNO,⁴ N.G. DE SANTO⁵

¹Department of Structure Function and Biological Technologies, University Federico II, Naples, ²Department of Veterinary Medicine and Animal Production, University Federico II, Naples, ³Division of Heart Surgery, University of Campania Luigi Vanvitelli, Naples, ⁴Department of Physical and Mental Health, University of Campania Luigi Vanvitelli, Naples, ⁵University of Campania Luigi Vanvitelli, Naples, Italia

Αρχεία Ελληνικής Ιατρικής 2020, 37(Συμπλ 2):53–56

Από το 1895–1908, ο Vincenzo Diamare (1871–1966) έκανε καινοτόμες μελέτες σχετικά με τη λειτουργία των μη λοβωδών κυττάρων του παγκρέατος, τα οποία περιγράφει ο Paul Langerhans το 1869. Μέσω συγκριτικών ανατομικών και φυσιολογικών μελετών, καθόρισε την ενδοκρινική τους λειτουργία και τη ρύθμιση του μεταβολισμού γλυκόζης στον άνθρωπο. Τα στοιχεία του επιβεβαιώθηκαν από τους E. Laguesse, W. Schulze, E. Sauerbeck, N. Minkowski και πολλούς άλλους, μεταξύ των οποίων ο J.J.R. McLeod. Όταν το 1923 απονεμήθηκε το βραβείο Νόμπελ Ιατρικής και Φυσιολογίας στους Frederick Grant Banting και John James Rickard McLeod, το όνομά του δεν αναφέρθηκε. Η Επιτροπή Νόμπελ παραμέλησε επίσης όχι μόνο τον Charles Best και τον Bertrand Collip που ανήκαν στην Ομάδα Ερευνών του Τορόντο, αλλά και τους N. Paulescu, G.L. Zuelzer, S.S. Kleiner και E. Lanceraeux. Ο Diamare δεν διαμαρτυρήθηκε. Καθ' όλη τη ζωή του, συνέχισε να ερευνά το θέμα και στην ηλικία των 85 ετών συνέγραψε μια σημαντική ανασκόπηση (85 σελίδων), αναφέροντας σχολαστικά τις ιδέες των υποστηρικτών και των αντιπάλων του, χωρίς δριμύτητα.

Λέξεις ευρητηρίου: Ανακάλυψη ινσουλίνης, Ενδοκρινική λειτουργία του παγκρέατος, Ινσουλίνη, Paul Langerhans, Vincenzo Diamare

References

- DIAMARE V. I corpuscoli surrenali di Stannius ed I corpi del cavo addominale dei teolostei. Notizie anatomiche e morfologiche. *Boll Soc Nat Napoli* 1895, IX:10–24
- DIAMARE V. Ricerche intorno all'organo interrenale degli Elasmobranchi ed ai corpuscoli di Stannius de Teleostei. Contributo alla morphologia delle capsule surrenali. *Mem Soc Ital Scienze Serie III*, 1896, tomo I
- DIAMARE V. Studii comparativi sulle isole di Langherans del pancreas. *Int Monatschr Anatomie Physiologie* 1899, 16:155–176
- DIAMARE V. Studii comparativi sulle isole di Langherans del pancreas. *Int Monatschr Anatomie Physiologie* 1899, 16:177–208
- DIAMARE V. Studii comparativi sulle isole di Langherans del pancreas. *Int Monatschr Anatomie Physiologie* 1905, 32:129–136
- DIAMARE V. Varietà anatomiche dell'interrenale. *Archivio di Anatomia e di Embriologia* 1905, 4
- DIAMARE V. Zur vergleichende Physiologie des Pankreas. Versuche über die Totalexstirpation des Pankreas und weiteres über die Glykolyse bei Selachiern. *Zentralblatt für Physiologie* 1905, 19
- DIAMARE V. Zweite Mitteilung über die physiologische Bedeutung der Langherhan'schen Inseln im Pankreas. *Zentralblatt für Physiologie* 1905, 19
- DIAMARE V. Sul nuovo indirizzo della questione del rapporto tra pancreas ed economia del glucosio nell'organismo. *Rivista storico-critica e ricerche. Il Tommasi. Giorn Biol Med* 1907, II:132–137
- DIAMARE V. Sul nuovo indirizzo della questione del rapporto tra pancreas ed economia del glucosio nell'organismo. *Rivista storico-critica e ricerche. Il Tommasi. Giorn Biol Med* 1907, II:152–155
- DIAMARE V. Sulla funzione endocrina del pancreas e sugli elementi che la disimpegnano. *Arch Fisiol* 1908, V:253–257
- BANTING FG, BEST CH. The internal secretion of the pancreas. *J Lab Clin Med* 1922, 7:251–271
- COLLIP JB. The original method as used for the isolation of insulin in semipure form for the treatment of the first clinical cases. *J Biol Chem* 1923, 55:40–41
- BANTING FG, BEST CH, COLLIP JB, CAMPBELL WR, FLETCHER AA. Pan-