

NASSER MALEKNIA (1931-2007)

FATHER OF MODERN BIOCHEMISTRY IN IRAN

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Professor Nasser Maleknia, who passed away on 15 June 2007, was one of the most distinguished professors of Tehran University. His greatest achievement was training of several generations of Iranian physicians and scientists who will always remember his unique style of teaching and his modest manner in life. Nasser Maleknia was born on 4 August 1931 in Tehran. As a teenager he was fond of mathematics and geometry. He left Iran in 1949 to study chemical engineering and principles of medicine in New York University (NYU). He then moved to France where he studied medicine in “*Faculté de Médecine de Paris*”(1).

During his clinical training in medical school, he took evening courses to study Electronics in a technical school in Paris for two years (1).



Fig. 1. Professor Nasser Maleknia (1931-2007)

This enabled him to earn a living by servicing the electronic equipments in department of Medical Biochemistry in *Hôpital des Enfants Malades* in Paris.

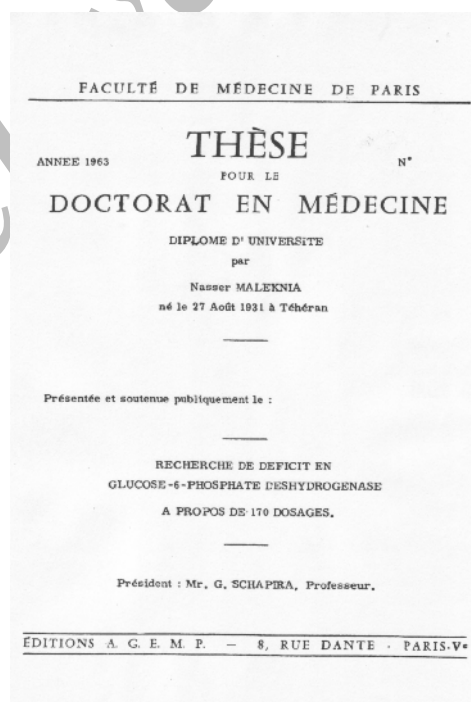


Fig. 2. Maleknia's doctoral thesis on G6PD deficiency

Because of his excellent background in chemistry, Professor Georges Schapira - the director of Department of Medical Biochemistry- encouraged Maleknia to study biochemistry in his Department. In the early part of his scientific career Maleknia studied the mechanism of haemolysis in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency.

He observed that the balance between the levels of Catalase and G6PD in red blood cells is an important predictor of disease outcome in these patients (2). He presented this work to the Faculty of Medicine in Paris as his doctoral thesis (Fig. 2).

Among the faculty members in Department of Medical Biochemistry was Jacques Kruh who was famous for his seminal work on haemoglobin

synthesis (3). Kruh had already demonstrated that haemoglobin can be synthesized in reticulocytes which have no DNA (3). These observations were essential to our current understanding on the role of mRNA in protein synthesis. Maleknia joined Kruh's team to study the possibility of cell-free synthesis of haemoglobin (4-7). These studies lead to the discovery that the genetic information can be carried by a soluble fraction of reticulocytes and translated into specific protein on ribosomes from another species (6, 7).

These reports are among the most cited papers published by Maleknia during his scientific carrier (according to ISI, reference 6 and 7 have been cited 78 times so far).

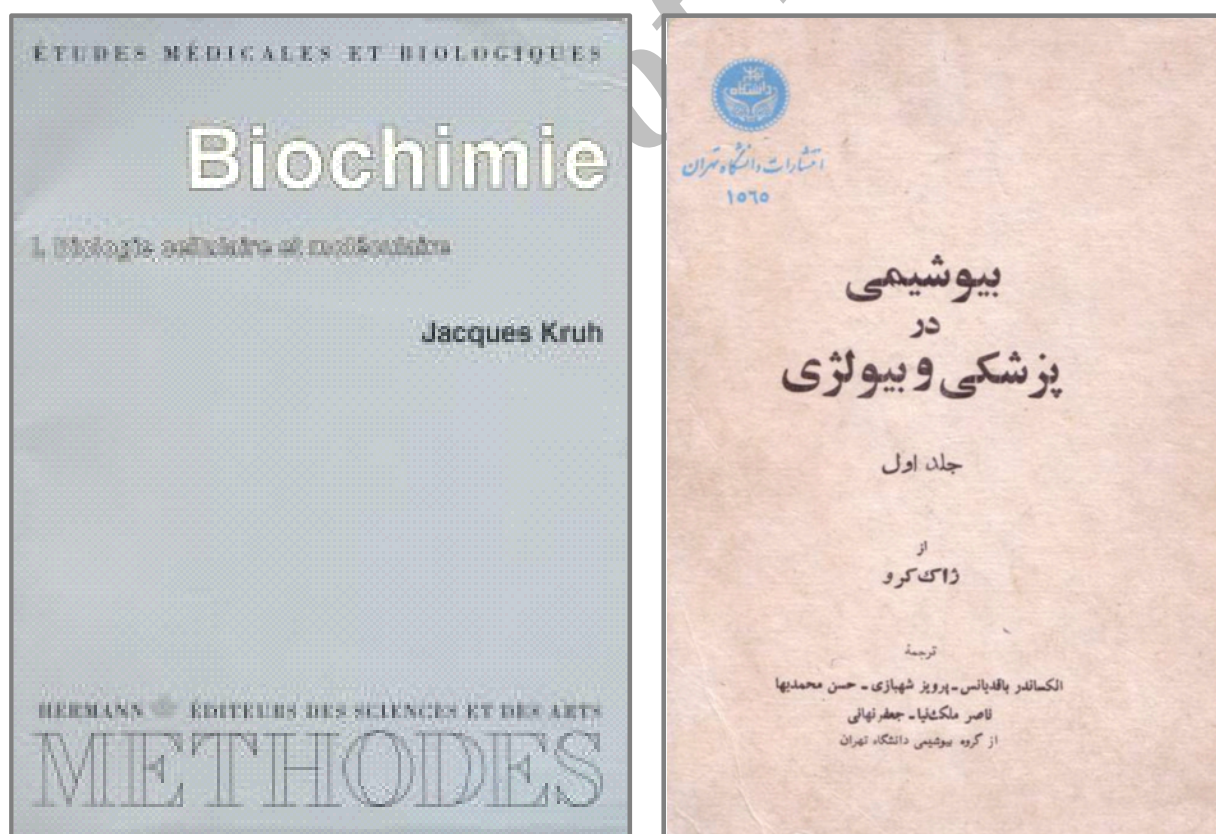


Fig. 3. The Jacques Kruh's textbook of Biochemistry was the first book which was translated to Farsi by Maleknia and his colleagues. This was a start for the idea of making Shahbazi-Maleknia textbook of general Biochemistry



Fig. 4. Shahbazi-Maleknia textbook of General Biochemistry. The book has been revised 25 times (right panel) since its first publication by Tehran University Press in 1978 (left panel).

Maleknia's main responsibility in Schapira's laboratory was to develop new methods for separation and detection of amino acids. He used volatile buffers along with ion exchange chromatography to separate amino acids in hydrolyzed proteins (8, 9). These techniques helped him and his colleagues to study hemoglobin's structure and function in health and disease (8-11). He continued his research on genetic control of hemoglobin synthesis when he moved to work as a Research Associates (chargés de recherche) in CNRS (*Centre national de la recherche scientifique*). After 10 years research in CNRS he was invited by the Iranian government to modernize Department of Biochemistry in Tehran University. He accepted the post and started working in Department of Biochemistry as Associate Professor in 1972. His main responsibility was to develop postgraduate courses (MSc and PhD) in Biochemistry in Tehran University. He felt that it is

essential to have an up to date textbook in Farsi to be used as a reference book for both medical and postgraduate students. He translated a textbook of Biochemistry which had recently been written by his former colleague Jacques Kruh in 1971 (12, Fig. 3).

Soon after beginning of his appointment in Tehran University, Maleknia started to recruit 15 MSc students in Department of Biochemistry. Maleknia used to enjoy saying that "*One swallow does not make a summer*" (13) an apparently controversial statement that he believed in science education in developing countries. He believed that department of Biochemistry should train as many postgraduate students as it can. In his opinion, if a department is going to start laboratory research from the scratch, it needs a big number of postgraduate students to set up basic and modern techniques in the laboratory. He hoped that these techniques will be inherited by the Department and will be used by future generation of students. When he became a full

professor of Biochemistry and the director of Department, he planned for recruiting 15 PhD and 20 MSc students in Biochemistry along with 25 specialist students in Clinical Biochemistry for each academic year.

Apart from his long-term plans for the future of Department of Biochemistry, his successors did not follow his plans and in contrast, they limited the number of postgraduate students by recruiting a handful of MSc and PhD students each year.

Shahbazi-Maleknia textbook of General Biochemistry

It was in Tehran University where he met Professor Parviz Shahbazi who encouraged Maleknia to write an updatable textbook based on their experience in teaching biochemistry to Iranian students. The first edition of *Shahbazi-Maleknia textbook of General Biochemistry* was published by Tehran University Press in 1977. *Shahbazi-Maleknia textbook of General Biochemistry* has two volumes. First volume is focused on the Structural Biochemistry and the second volume is dedicated to the Metabolism and its regulation. The textbook has been revised 25 times so far and has been the standard textbook for medical schools throughout the country for many years. Many of his former and later students have been involved in the book revision. Maleknia generously acknowledged all of these students and colleagues by printing their names on the cover of the textbook (Fig. 4).

His teaching style

Maleknia was an inspiring and dedicated teacher. For his students it has been impossible to forget his teaching style during his lectures. His lectures were rich and amusing. His students remember a *pseudo-person* (so called *Siroos khan*) who was always engaged in his lessons.

Maleknia trained several generations of Iranian physicians and Biochemists with his novel and friendly methods. Soon after his early retirement from Tehran University he kept contact with his students by holding weekly scientific meeting in his house. The meetings were friendly and informal which would accompanied by a traditional beef stew as a memorable finale.

His many students, friends and colleagues rejoice in his contributions, and mourn the passing of this gentle and humble man.

Selected list of publications

A) Peer-reviewed articles in international journals

Maleknia N. Myoglobin biosynthesis by postnatal rat-heart cells in tissue-culture. *Revue De Medecine Veterinaire*. 1979; 130 (4): 589.

Blum N, Kneip B, **Maleknia N.** Regulative effects of globin on hemoglobin biosynthesis. *Biochimie*. 1972; 54(3): 355-63.

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Blum N, **Maleknia N**, Schapira G. Regulation of the synthesis of hemoglobin by its subunits. *Bull Soc Chim Biol (Paris)*. 1970: 1279-86.

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Schapira G, Benrubi M, **Maleknia N**, Reibel L. Rabbit hemoglobin: a variant resulting from allelomorphism and not from an ambiguity: Hb a 29 Val replaced by Leu. *Biochim Biophys Acta*. 1969; 188(2): 216-21.

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Rosa J, **Maleknia N**, Vergoz D, Dunet R. A new abnormal hemoglobin: hemoglobin Ja-Paris 12 ala---asp. Nouv Rev Fr Hematol. 1966; 6(3): 423-6.

Maleknia N, Ebersolt C, Schapira G, Dreyfus JC. Changes in the opposite direction of the level of myoglobin in the red and white muscles after nerve section. Bull Soc Chim Biol (Paris). 1966; 48(7): 905-8.

Padiou P, **Maleknia N**. On a new system of volatile buffers for chromatography of amino acids on cation exchange resins. Bull Soc Chim Biol (Paris). 1965; 47: 493-504.

Schapira G, Padiou P, **Maleknia N**, Kruh J, Dreyfus JC. Acellular biosynthesis and genetic information supplied by an RNA from a soluble fraction of reticulocytes. Bull Soc Chim Biol (Paris). 1965; 47(8): 1687-9.

Dreyfus JC, **Maleknia N**, Kaplan JC. Research on glucose-6-phosphate dehydrogenase deficiency in France. Apropos of 200 determinations. Nouv Rev Fr Hematol. 1964; 64:791-802.

Schapira G, Padiou P, **Maleknia N**, Dreyfus JC, Kruh J. Orientation test of the specificity of hemoglobin synthesis by a soluble reticulocyte factor. C R Hebd Seances Acad Sci. 1964; 258: 2221-3.

B) Books in Farsi

Persian Translation of: Kruh J. (1971) Biochemie, Études Médicales et Biologiques. Tehran University Press (No 1565) 1976.

Shahbazi-Maleknia textbook of General Biochemistry. Tehran University Press (No 1622) (25 Editions from 1978 to 2006).

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11. Schapira G, Benrubi M, Maleknia N, Reibel L. Rabbit hemoglobin: a variant resulting from allelomorphism and not from an ambiguity: Hb a 29 Val replaced by Leu. *Biochim Biophys Acta*. 1969; 188(2): 216-21.
12. Kruh J. *Biochimie, Études Médicales et Biologiques*. 1971 Hermann Collection, Paris. 501 p.
13. Professor Maleknia originally used to use the expression that “*one flower does not make a spring*”. Here we replace it with the most relevant slang in English which gives the same meaning: “*one swallow does not make a summer*”.

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