

6<sup>th</sup> Global Diabetes

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### Combating diabetes mellitus, a modern epidemic, with a new biological treatment based on stem cells differentiation stage factors (SCDSFs) taken from zebra fish embryos

Diabetes mellitus is a chronic metabolic disease characterized by hyperglycemia resulting in defects in insulin secretion, insulin action or both. Diabetes is frequently associated with obesity, which is considered the major cause for T2D. The incidence of diabetes and obesity is steadily increasing across all human populations. This emerging epidemic is a serious threat to human health worldwide. Pathogenetic mechanisms of T2D have not been well defined, however the majority of mechanisms are associated with inflammatory responses that include high levels of C-reactive protein, interleukin 1 $\beta$ , interleukin 6 and tumor necrosis factor circulating in the blood. This leads to alterations in the complex regulatory network in which different adaptive systems such as neuro-endocrine-immune-metabolic systems work in concert. Since chronic stress and inflammation in diabetes patients attack their ability to produce energy, changes in metabolic function are fundamental. Epigenetic changes in key-chromatin histone methylation patterns and telomere length have been observed under diabetes conditions.

Despite the accumulation of extensive data at the molecular and cellular levels, the mechanisms of diabetes development and complications are still not fully understood and limitations in current therapeutic approaches persist. Our studies strongly suggest that in order to adequately treat chronic inflammatory disease we must not focus on symptoms or specific diseases, but instead we need to act on the dysfunctional pathways that actually cause the conditions linked to inflammation. The biological complexity of unresolved inflammation, and the limited understanding of the kind of dysfunctions that underlie many chronic diseases (including metabolic syndrome, diabetes, brain malfunction, cardiovascular diseases and various cancers) make diagnosis, prevention, and targeted therapeutic treatments particularly difficult. Then, we propose here a versatile therapy, using stem cells stage differentiation factors obtained from zebra fish embryos, which can reprogram human body stem cells, thereby helping the body to defend itself.

This treatment enhances stem cell expression of multipotency, activates both telomerase-dependent and -independent antagonists of cell senescence, removes the waste from aberrant DNA methylation and histone acetylation, and controls cells proliferation. In summary, SCDSFs networks control metabolic disease and prevent neurological, vascular and cancer degeneration, and restore homeostasis of neuro-endocrine-metabolic mechanisms that have been disrupted by stress and environmental threats.

### Biography

Guido Norbiato received his medical degree at 25 years of age from the University of Milan, Italy, where he also completed his post-doctoral studies, specializing in endocrinology and metabolism, and university teaching, and served as an assistant professor for many years. He began his medical career at the Luigi Sacco University Hospital in Milan, where he became the Chief Director of the Endocrinology and Metabolism Units, founding its first Endocrinology Laboratory following his Directorship of its Special Diseases Department. Dr. Norbiato has published more than 140 articles and various other publications in internationally referred journals on his research in endocrinology, metabolism, and autonomic, immune, inflammatory, and vascular systems, with an Impact Factor of 656. He has also edited two books on endocrinology and metabolism in the context of HIV infection.

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