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To whom it my concern,

First of all, I would like to express my gratitude to the European Society of Cardiology for selecting my application.

In current report I will described the work performed in the host institution, Institute of Molecular and Translational Therapeutic Strategies, Hannover, Germany, under the supervision of Prof. Dr. Dr. med. Thomas Thum, from November 30 to December 18.

Data obtained during the short stay are unpublished. Results will not be explained in detail.

Background

Heart disease is the leading cause of morbidity and mortality in type 2 diabetes mellitus (T2DM) (Ryden et al., Eur Heart J, 2013). Cardiac dysfunction is often unrecognized in the early stage of the disease due to the absence of symptoms or signs. Effective tools to identify cardiac-related complications during subclinical stages, such a blood test, are of clinical interest.

Long non-coding RNAs (lncRNAs) are a novel class of non-coding RNAs that play a critical role in cardiac development and disease (Thum y Condorelli, Circ Res, 2015). Recently, it has been proposed that circulating lncRNAs are potential biomarkers of cardiovascular disease (Kumarswamy et al., Circ Res, 2014; Vausort et al., Circ Res, 2014). Nevertheless, little is known about their potential as indicators of cardiac complications in T2DM patients.

Objective

The evaluation of circulating lncRNAs as early indicators of cardiac complications in T2DM patients.

Methodology

A panel of 12 lncRNAs related to cardiac/diabetic pathophysiology was evaluated in serum from 48 T2DM men with well-controlled T2DM of short duration and without structural heart disease or inducible ischemia (assessed by dobutamine stress echocardiography) and 12 healthy subjects within the same range of age and BMI.

Serum lncRNA levels were measured by quantitative real-time PCR using the methodology established in the Institute of Molecular and Translational Therapeutic Strategies

Results

- Measured lncRNAs were abundantly presented in serum of T2DM patients and healthy subjects.
- Serum levels of lncRNAs were positively correlated with each other in both T2DM patients and healthy subjects.
- There were no differences in serum lncRNAs levels between study groups.
- Serum levels of lncRNAs were associated with clinical, metabolic and biochemical parameters in both T2DM patients and healthy subjects.
- In univariate regression analysis, serum levels of lncRNAs were intimately associated with myocardial function parameters in uncomplicated T2DM patients ($P < 0.050$ for all associations). The association between lncRNAs and myocardial function parameters remained statistically significant after adjusting for potential confounding factors.
- There was no association between serum lncRNAs levels and myocardial function parameters in healthy subjects

Conclusions

The present study reports for the first time that serum levels of lncRNAs are useful indicators of subclinical myocardial dysfunction, which could ultimately lead to novel biomarkers for the diagnosis of cardiac-related complications in T2DM patients. The physiological/pathophysiological role of serum lncRNAs deserves further investigation.

This study will be the basis for future studies in larger populations. Specific lncRNAs associated with myocardial dysfunction in T2DM patients

represent novel candidates for cardiovascular risk assessment and evaluation of therapies, but also attractive therapeutic targets.

References

Kumarswamy, R*., et al.* (2014). Circ Res 114, 1569-1575.

Ryden, L*., et al.* (2013). Eur Heart J 34, 3035-3087.

Thum, T*., et al.* (2015). Circ Res 116, 751-762.

Vausort, M*., et al.* (2014). Circ Res 115, 668-677.

The funds have been spent in travel and accommodation expenses.

During the short stay, I have been exposed to a high-quality research environment that has improved my scientific skills. The Institute of Molecular and Translational Therapeutic Strategies is a leading center in the study of non-coding RNAs in the context of cardiovascular disease. I have been trained in novel techniques extremely valuable for my research lines, bringing back unique knowledge to my current laboratory. In addition, the funds have been satisfactorily used for the establishment of a research link from Dr. de Gonzalo (IIB Sant Pau, Barcelona, Spain) to Institute of Molecular and Translational Therapeutic Strategies (Hannover, Germany).

I would like to thank Prof. Dr. Dr. med. Thomas Thum, Dr. Claudia Bang and Franziska Schöttmer for their hospitality and invaluable help during my stay.

Yours sincerely,

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