Myoferlin Contributes to the Metastatic Phenotype of Pancreatic Cancer Cells by Enhancing Their Migratory Capacity Through the Control of Oxidative Phosphorylation

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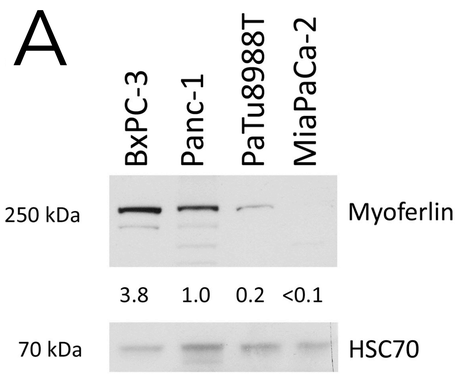
Introduction

Pancreatic ductal adenocarcinoma (PDAC) is one of the deadliest cancer with a 5-year survival rate <5%. Metastatic dissemination is the most frequent cause of death for PDAC patients, most of them being diagnosed after the primary tumor dissemination. Myoferlin, a key protein in membrane fusion was described as overexpressed in PDAC and associated to mitchondrial fitness and function. Considering that oxidative phosphorylation has an emerging role in migration process, we investigate the role of myoferlin in metastases formation.

Results



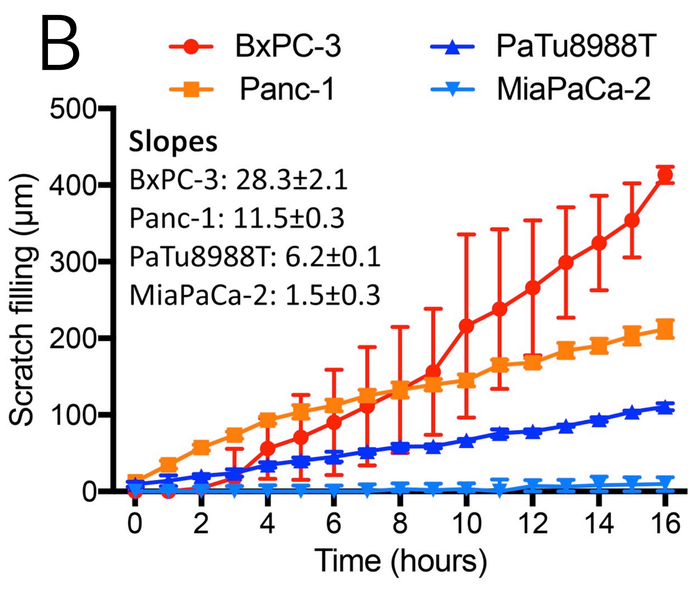


Figure 1. Myoferlin abundance (A) is correlated with migratory phenotype (B) and Oxphos in PDAC cell lines

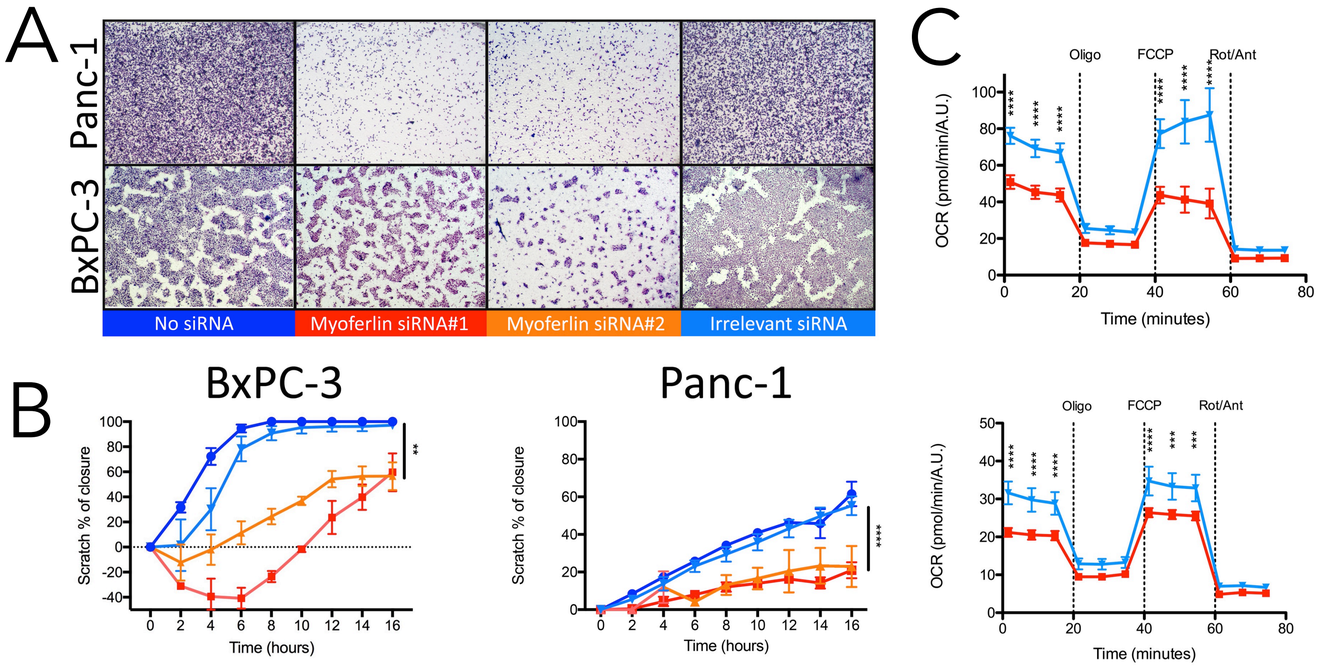


Figure 2. Myoferlin depletion leads to migration (A & B) and respiration decrease (C) in BxPC-3 and Panc-1 cells

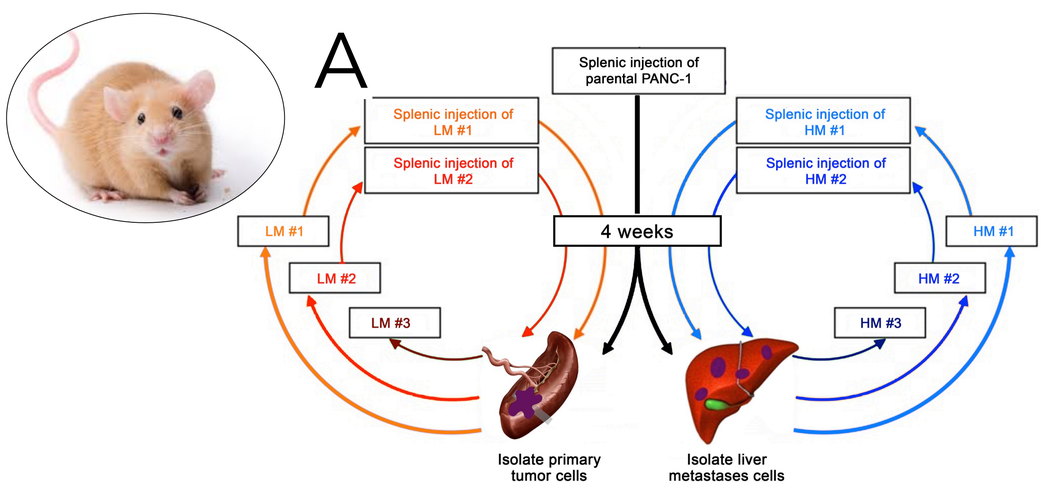


Figure 3. Creation of a metastatic mouse model using Panc-1 cells

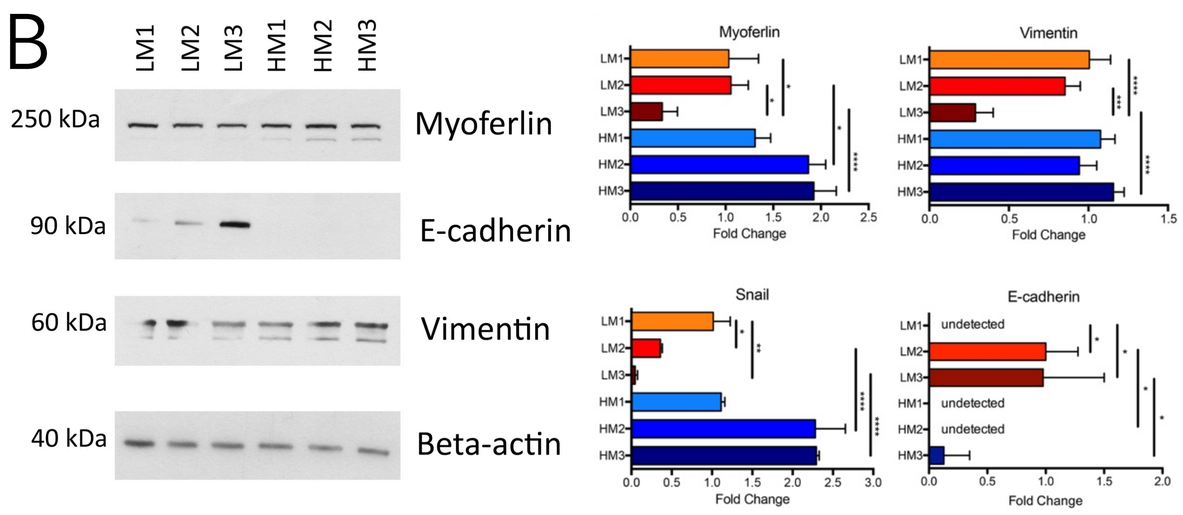


Figure 4. Myoferlin is overexpressed in high metastatic Panc-1 cell lines matching with EMT transition

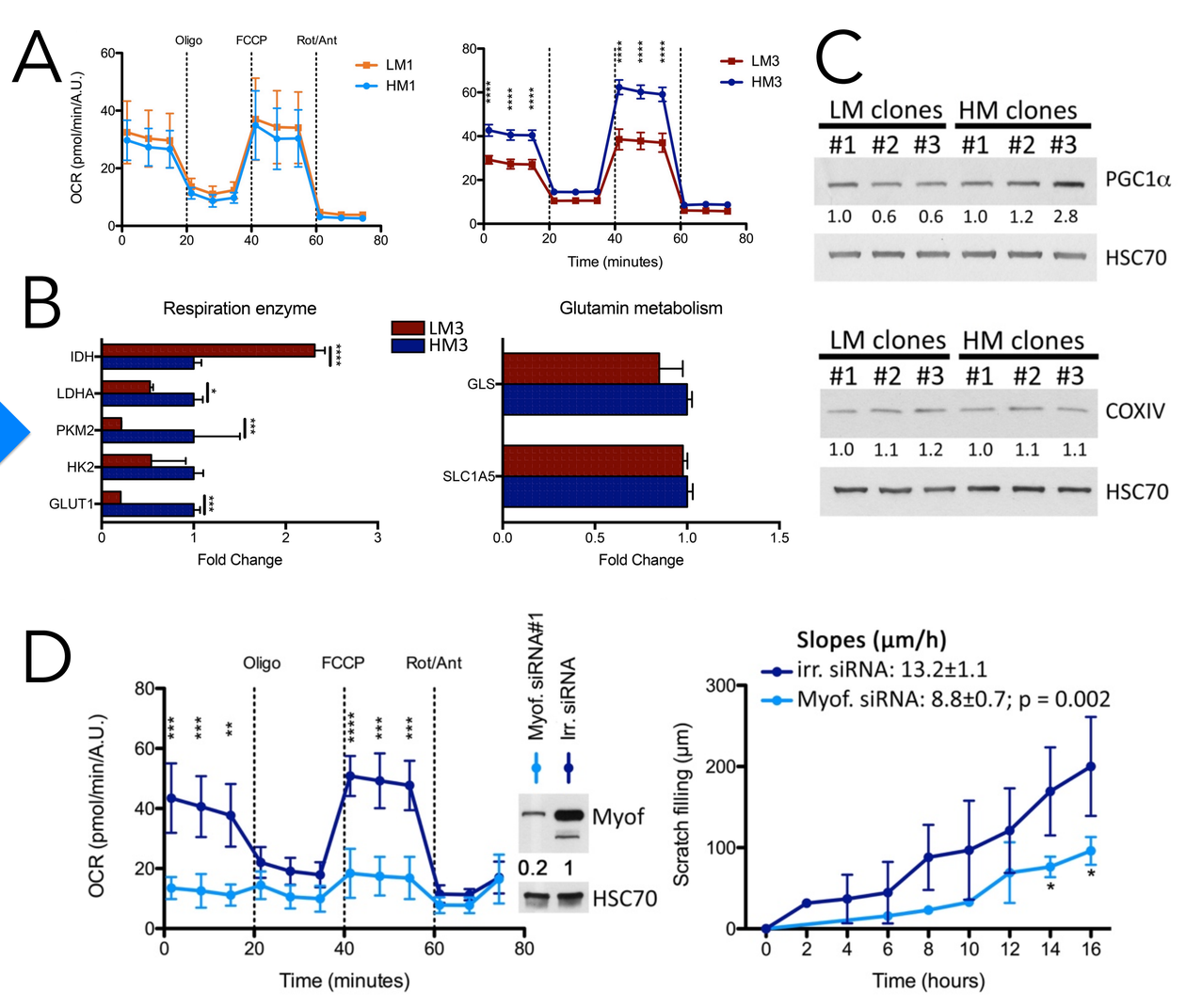


Figure 5. High metastatic cell lines switch to oxidative metabolism through the expression of myoferlin

Conclusion

Our results indicate that myoferlin expression is high in high migratory cell lines. Its depletion leads to a decrease of migration and mitochondrial respiration in high migratory Panc-1 and BxPC-3 cell lines. Moreover, myoferlin is overexpressed in high metastatic Panc-1 cell lines generated from mouse model. Finally, myoferlin control migration through oxidative phosphorylation in high metastatic Panc-1 cells.