Background: Myocarditis is characterized by inflammation and damage of the heart muscle. Viral myocarditis is the most common etiology in developed countries, where Coxsackievirus B3 (CVB3) is among the most common pathogens. Viral infection was shown to be associated with changes in the NEPN (Nrg1, ErbB4, Psen1, and Nup98) signalling axis proteins. We hypothesize that during pathogenesis, the NEPN proteins are cleaved, generating fragments released into the blood that are specific to viral myocarditis. Our project aims to develop a non-invasive, blood based diagnostic assay by evaluating the NEPN cleavage fragments as potential biomarkers.

Design: iPSC-derived cardiomyocytes and A/J mice were infected with sham (PBS) and CVB3; blood and hearts were harvested corresponding to different phases of viral myocarditis. IHC and Western-Blot analysis were performed to observe the expression of NEPN. Sham and CVB3 infected HeLa cells were used to observe the expression and sub-cellular localization of the NEPN proteins via Western-Blot and confocal microscopy respectively.

Results: Nrg1 is cleaved into ~65kDa (in heart-tissue) and ~35kDa (in plasma) fragments in A/J mice after infection. A ~37kDa cleavage fragment of ErbB4 was detected in plasma. Western-blot analyses suggested that viral attachment was sufficient to induce ErbB4 cleavage. Co-localization of protease Psen1 and its substrate ErbB4 was observed at the cell membrane of infected HeLa cells.

Conclusion: Detected cleavage fragments and characterization of the NEPN signalling axis may be further evaluated as biomarkers to develop a blood-based diagnostic assay for viral myocarditis.

Themes:

Check (highlight) the most applicable theme according to the abstract.

| Innovation and Technology | Health and Wellness | Culture and Society | Sustainability and Conservation |

Comments: Good background. Lots of acronyms are used but not explained, which might make it hard for a broad audience to understand your abstract.