

## UNCROPPED GEL BLOTS

### Impaired intracellular calcium buffering contributes to the arrhythmogenic substrate in atrial myocytes from patients with atrial fibrillation

Funsho E. Fakuade, PhD<sup>1,2,3\*</sup>, Dominik Hubricht<sup>1,2\*</sup>, Vanessa Möller<sup>1,2\*</sup>, Izzatullo Sobitov<sup>1,2</sup>, Aiste Liutkute<sup>1,2,3</sup>, Yannic Döring<sup>1,2</sup>, Fitzwilliam Seibertz, PhD<sup>1,2,3</sup>, Marcus Gerloff,<sup>1,2</sup> Julius Ryan D. Pronto, PhD<sup>1,2</sup>, Fereshteh Haghighi, PhD,<sup>2,3,4</sup> Sören Brandenburg, MD,<sup>2,5</sup> Khaled Alhussini, MD<sup>6,7</sup>, Nadezda Ignatyeva, PhD<sup>2,5</sup>, Yara Bonhoff<sup>1,2</sup>, Stefanie Kestel<sup>1,2</sup>, Aschraf El-Essawi, MD<sup>2,4,8</sup>, Ahmad Fawad Jebran, MD<sup>2,4</sup>, Marius Großmann, MD<sup>2,4</sup>, Bernhard C. Danner, MD<sup>2,4</sup>, Hassina Baraki, MD<sup>2,4</sup>, Constanze Schmidt, MD<sup>9,10</sup>, Samuel Sossalla, MD<sup>11,12</sup>, Ingo Kutschka, MD<sup>2,4</sup>, Constanze Bening, MD<sup>6,7</sup>, Christoph Maack, MD<sup>7</sup>, Wolfgang A. Linke, PhD<sup>2,5,13</sup>, Jordi Heijman, PhD<sup>14,15</sup>, Stephan E. Lehnart, MD<sup>2,3,5</sup>, George Kensah, PhD<sup>2,4</sup>, Antje Ebert, PhD<sup>2,3,5</sup>, Fleur E. Mason, PhD<sup>1,2#</sup>, Niels Voigt, MD<sup>1,2,3#</sup>

<sup>1</sup>Institute of Pharmacology and Toxicology, University Medical Center Göttingen, Georg-August-University Göttingen, Germany

<sup>2</sup>DZHK (German Center for Cardiovascular Research), partner site Göttingen, Germany

<sup>3</sup>Cluster of Excellence "Multiscale Bioimaging: From Molecular Machines to Networks of Excitable Cells" (MBExC), Georg-August-University Göttingen, Germany

<sup>4</sup>Department of Thoracic and Cardiovascular Surgery, University Medical Center Göttingen, Georg-August-University Göttingen, Germany

<sup>5</sup>Department of Cardiology and Pneumology, Heart Research Center Göttingen, University Medical Center Göttingen, Göttingen, Germany

<sup>6</sup>Department of Thoracic and Cardiovascular Surgery, University Clinic Würzburg, Germany

<sup>7</sup>Comprehensive Heart Failure Center Würzburg, University Clinic Würzburg, Germany

<sup>8</sup>Department of Thoracic and Cardiovascular Surgery, Klinikum Braunschweig, Braunschweig, Germany

<sup>9</sup>Department of Cardiology, University Hospital Heidelberg, Heidelberg, Germany.

<sup>10</sup>DZHK (German Center for Cardiovascular Research) Partner Site Heidelberg/Mannheim, Heidelberg University, Heidelberg, Germany.

<sup>11</sup>Department of Cardiology, University Hospital Giessen & Kerckhoff Clinic, Giessen, Germany

<sup>12</sup>Department of Cardiology, Bad Nauheim & German Center for Cardiovascular Research (DZHK), Partner Site Rhine-Main, Germany

<sup>13</sup>Institute of Physiology II, University of Münster, Germany

<sup>14</sup>Gottfried Schatz Research Center: Division of Medical Physics and Biophysics, Medical University of Graz, Graz, Austria

<sup>15</sup>Department of Cardiology, Maastricht University Medical Centre and Cardiovascular Research Institute Maastricht, Maastricht University, Maastricht, The Netherlands

\*The first three authors contributed equally to this study.

Running title: Impaired Ca<sup>2+</sup> buffering in persistent AF patients

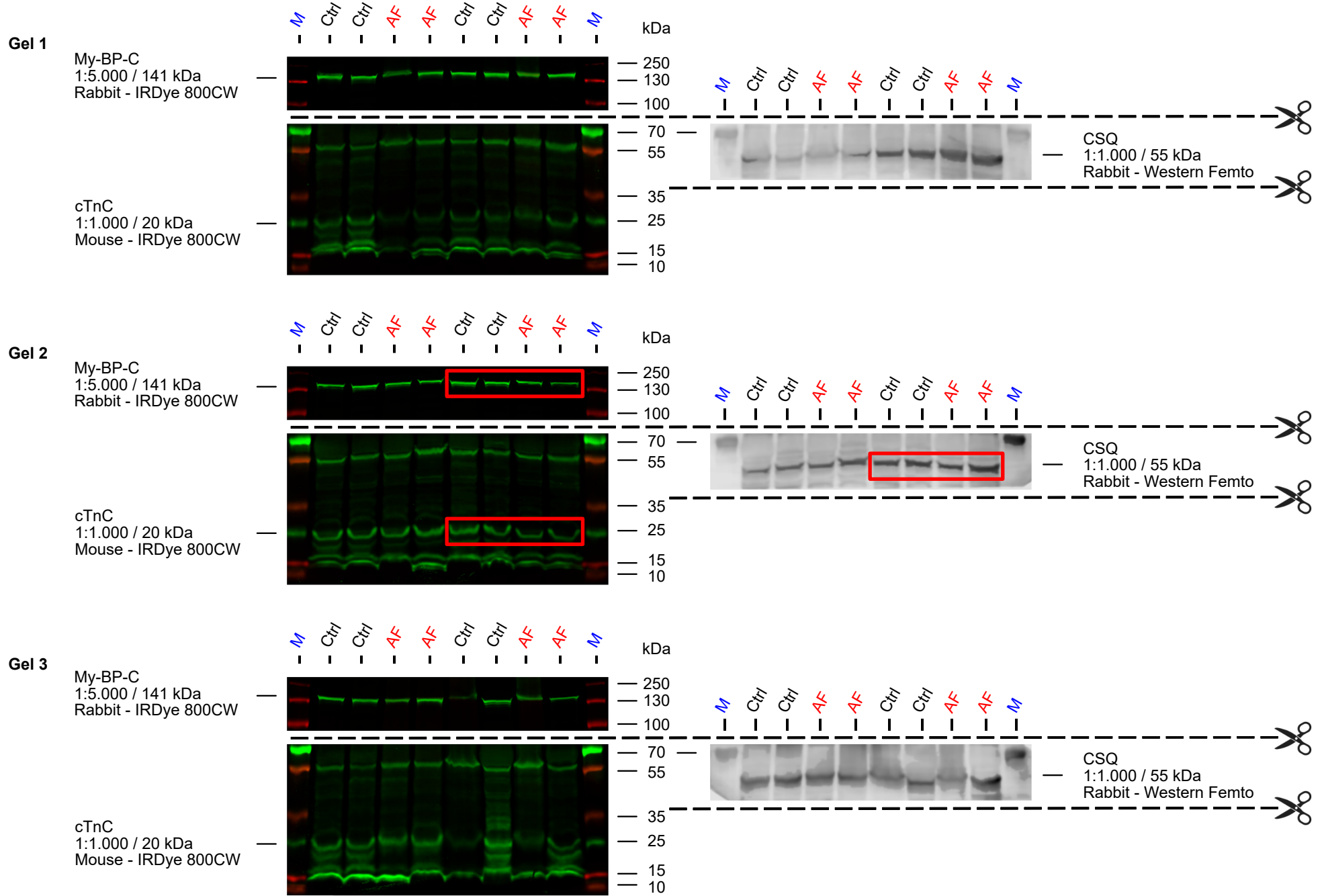
#Co-corresponding Authors:

Niels Voigt, Institute of Pharmacology and Toxicology, University Medical Center Göttingen, Robert-Koch-Straße 40, 37075 Göttingen; Phone: 0049-551-39-65174, Fax: 0049-551-39-65169; E-mail: [niels.voigt@med.uni-goettingen.de](mailto:niels.voigt@med.uni-goettingen.de)

Fleur E. Mason, Institute of Pharmacology and Toxicology, University Medical Center Göttingen, Robert-Koch-Straße 40, 37075 Göttingen; Phone: 0049-551-39-63707, Fax: 0049-551-39-65169; E-mail: [fleur.mason@med.uni-goettingen.de](mailto:fleur.mason@med.uni-goettingen.de)

**Full unedited gels for Figure 3A (I)**

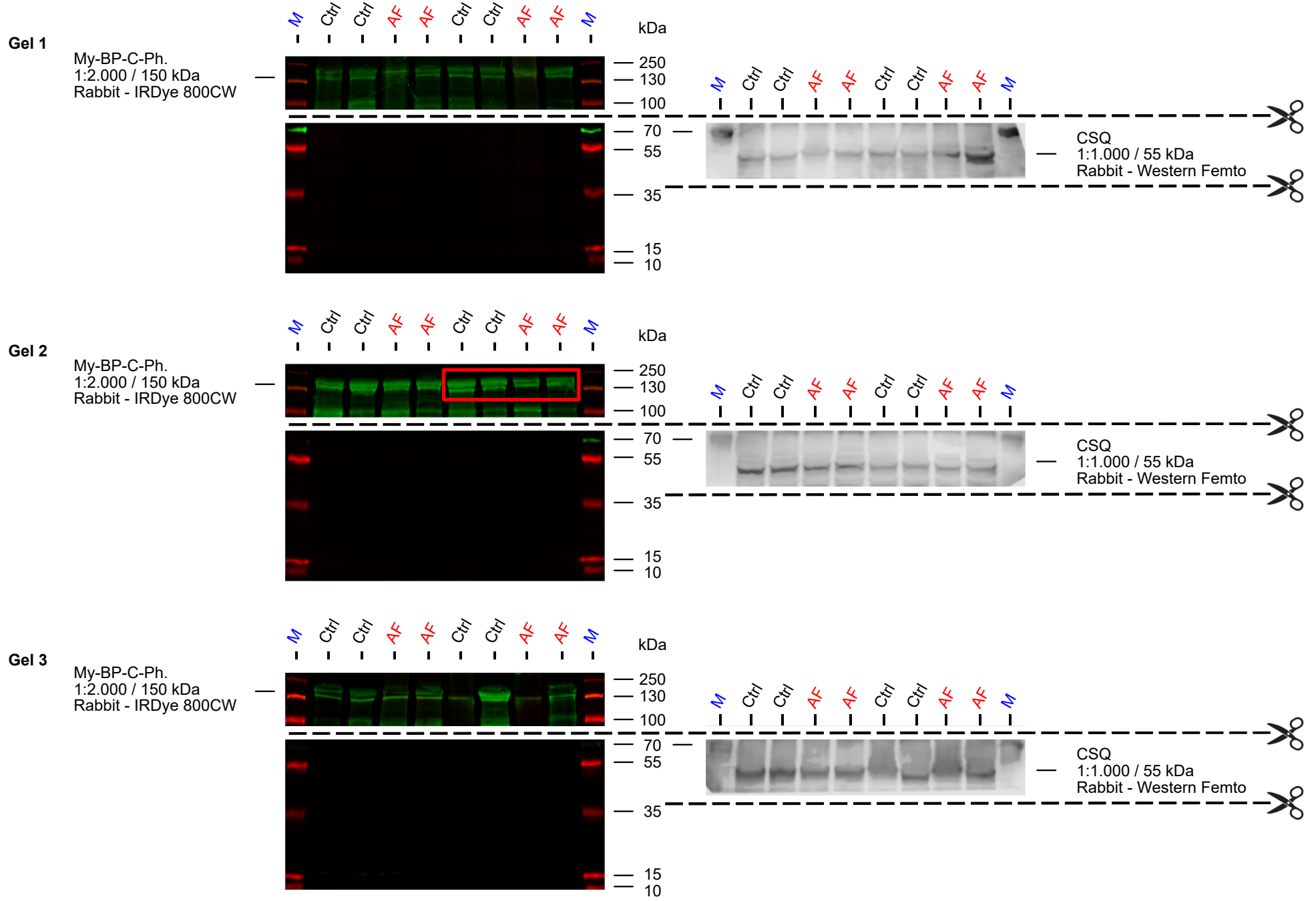
cMyBP-C  
cTnC



M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa  
Ctrl = Sinus rhythm  
AF = Persistent atrial fibrillation

**Full unedited gels for Figure 3A (II)**

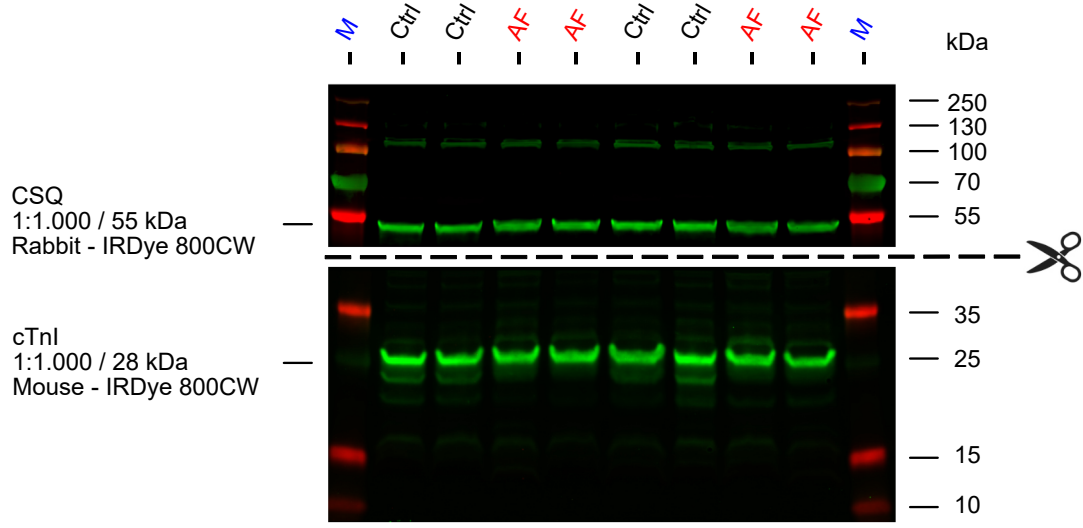
p-cMyBP-C



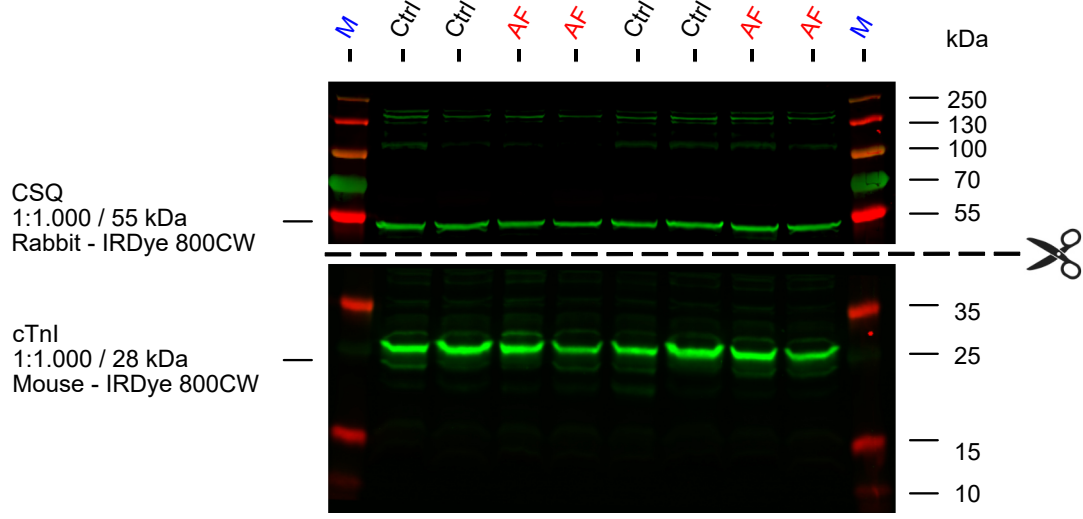
# Full unedited gels for Figure 3A (III)

cTnI

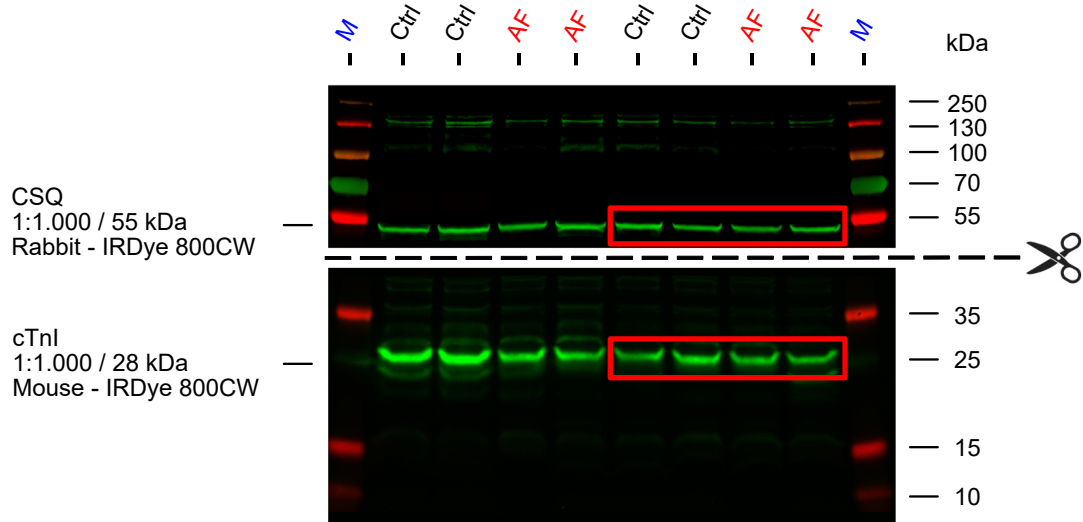
Gel 1



Gel 2



Gel 3



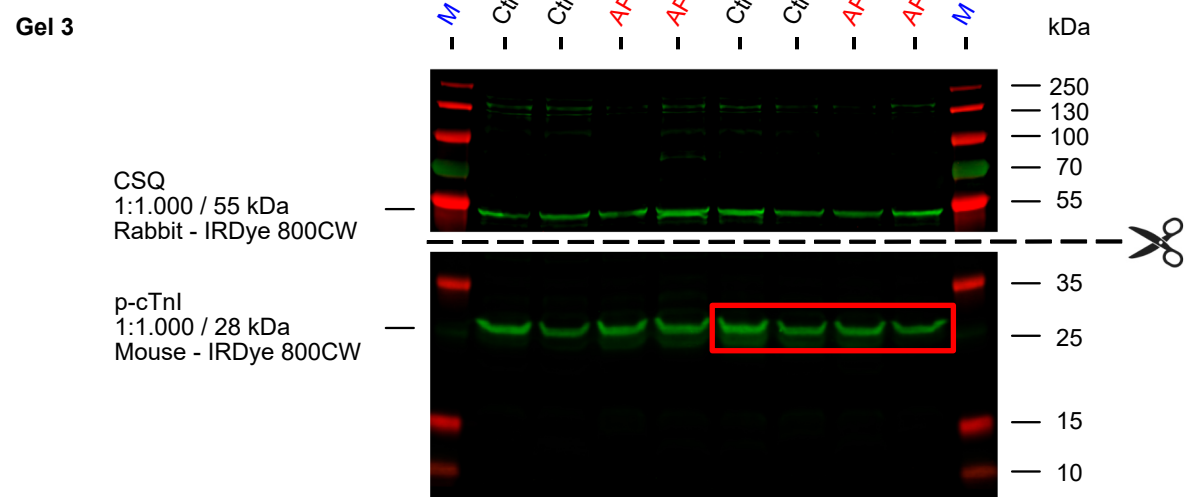
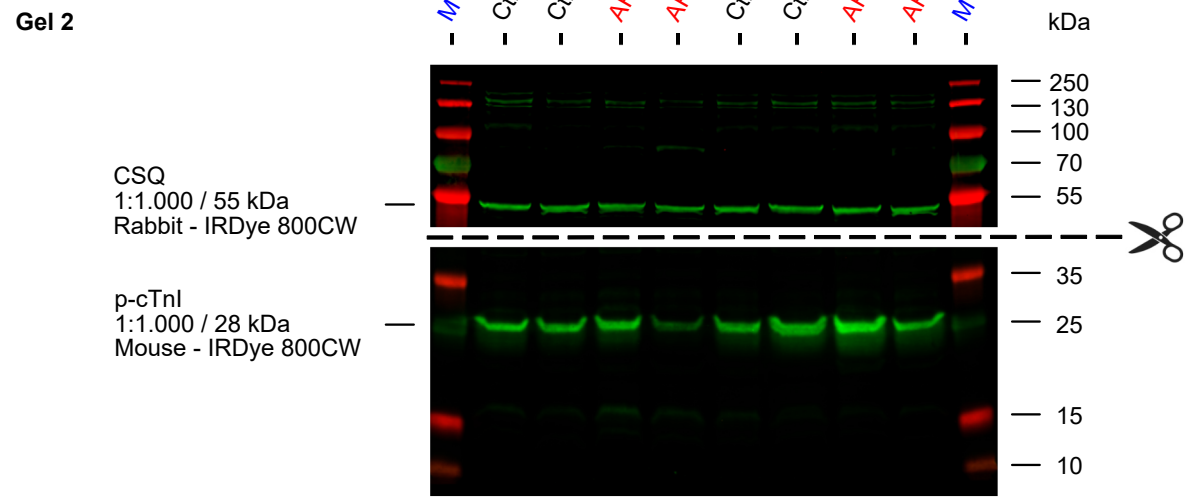
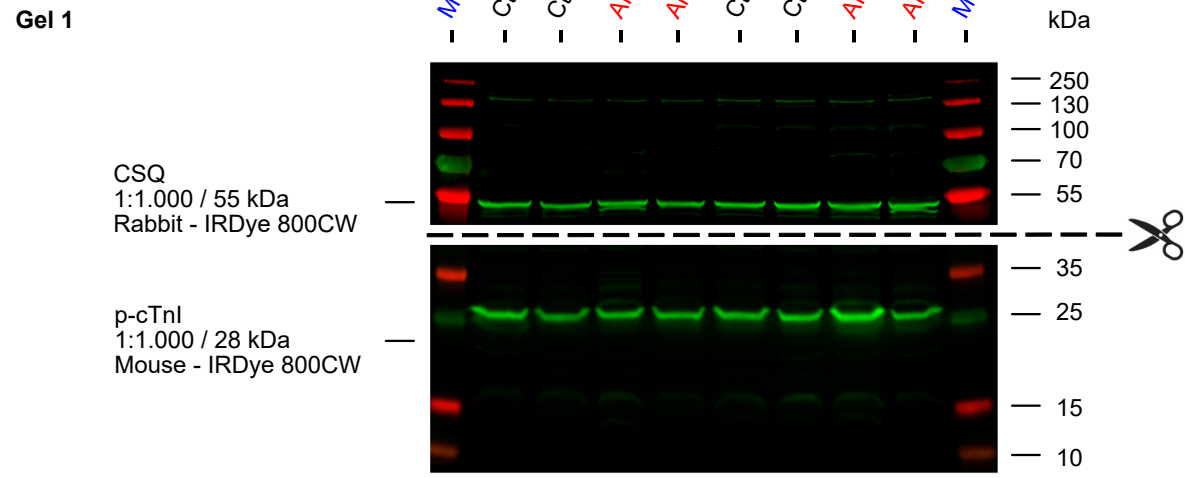
M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa

Ctrl = Sinus rhythm

AF = Persistent atrial fibrillation

# Full unedited gels for Figure 3A (IV)

p-cTnI



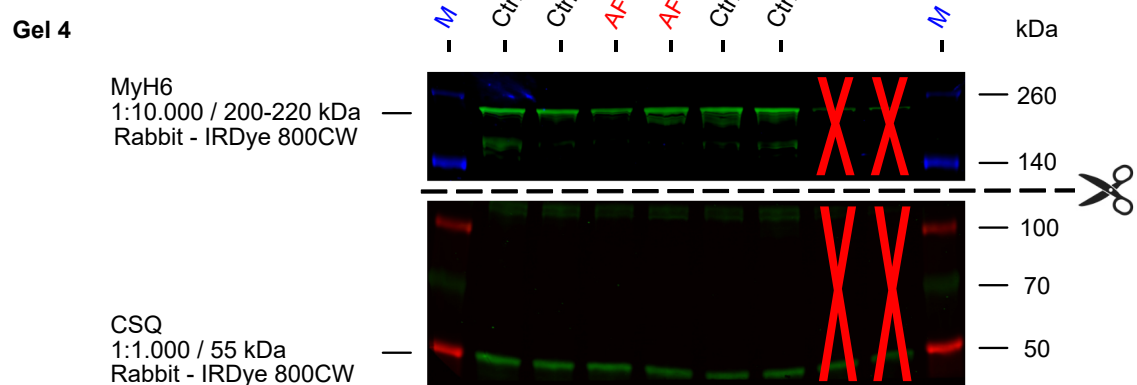
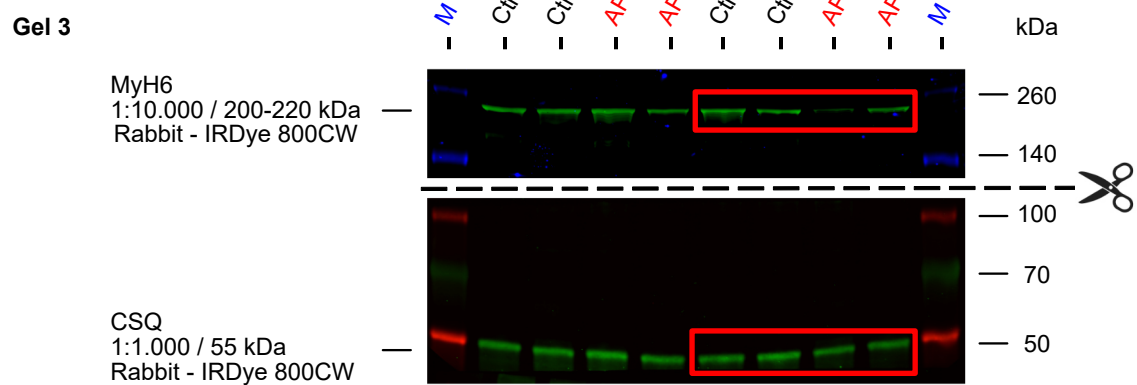
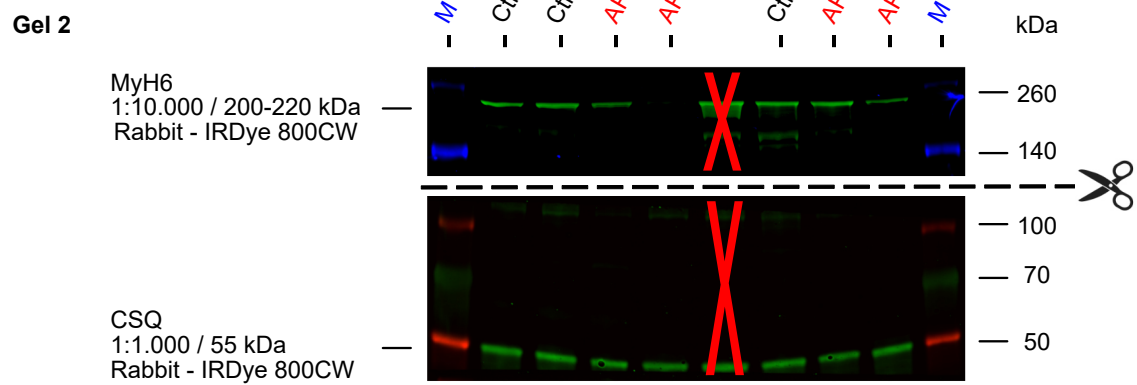
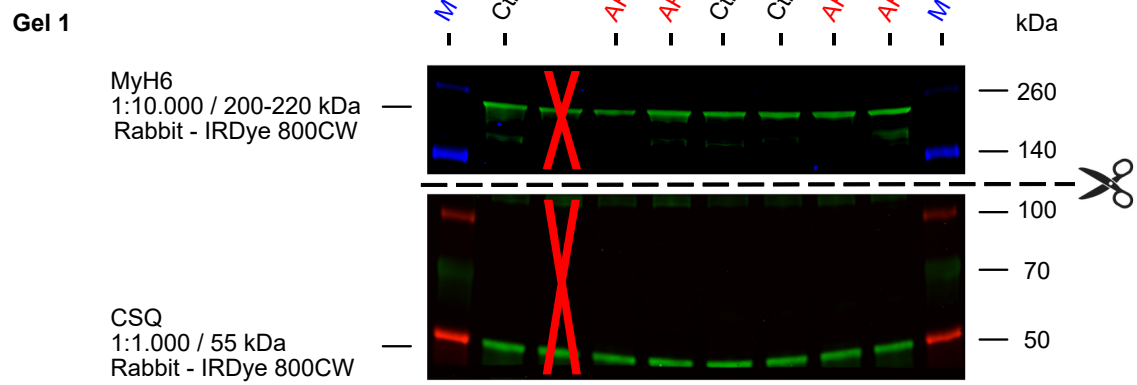
M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa

Ctrl = Sinus rhythm

AF = Persistent atrial fibrillation

**Full unedited gels for Figure S5A**

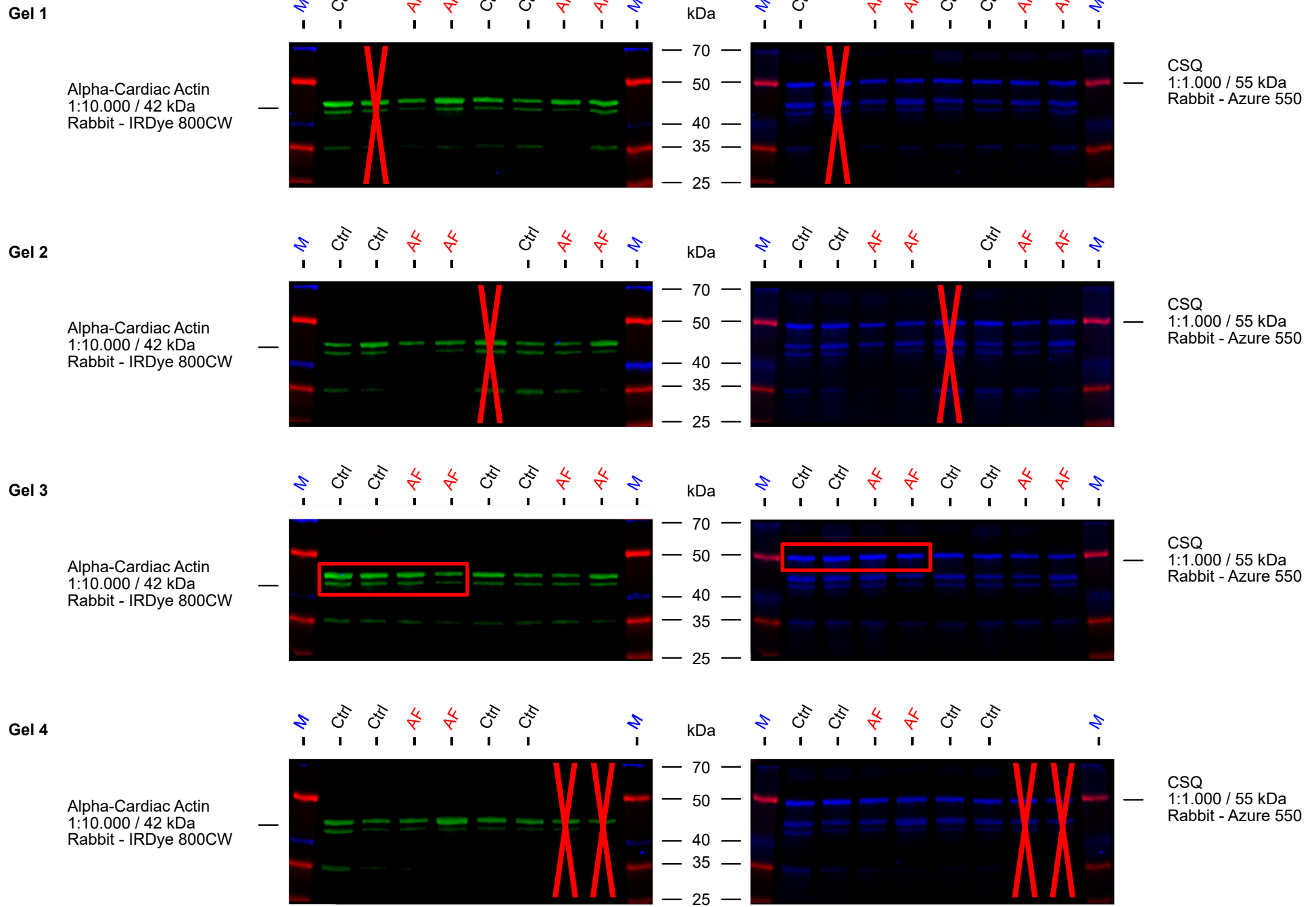
Myh6



M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa  
Ctrl = Sinus rhythm  
AF = Persistent atrial fibrillation

Full unedited gels for Figure S5B (I)

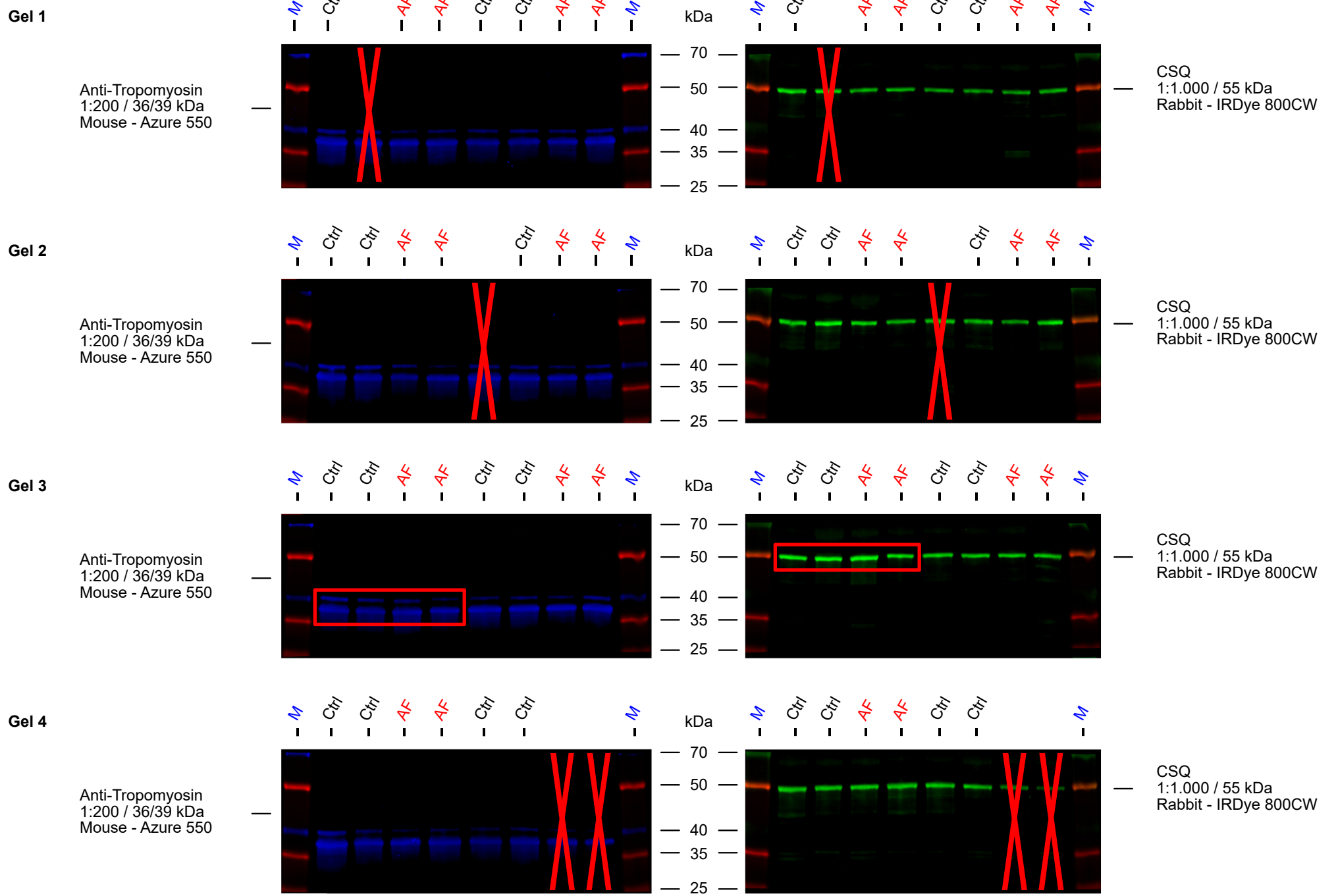
α-Actin



M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa  
 Ctrl = Sinus rhythm  
 AF = Persistent atrial fibrillation

**Full unedited gels for Figure S5B (II)**

Tm1  
Tm2



M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa  
Ctrl = Sinus rhythm  
AF = Persistent atrial fibrillation



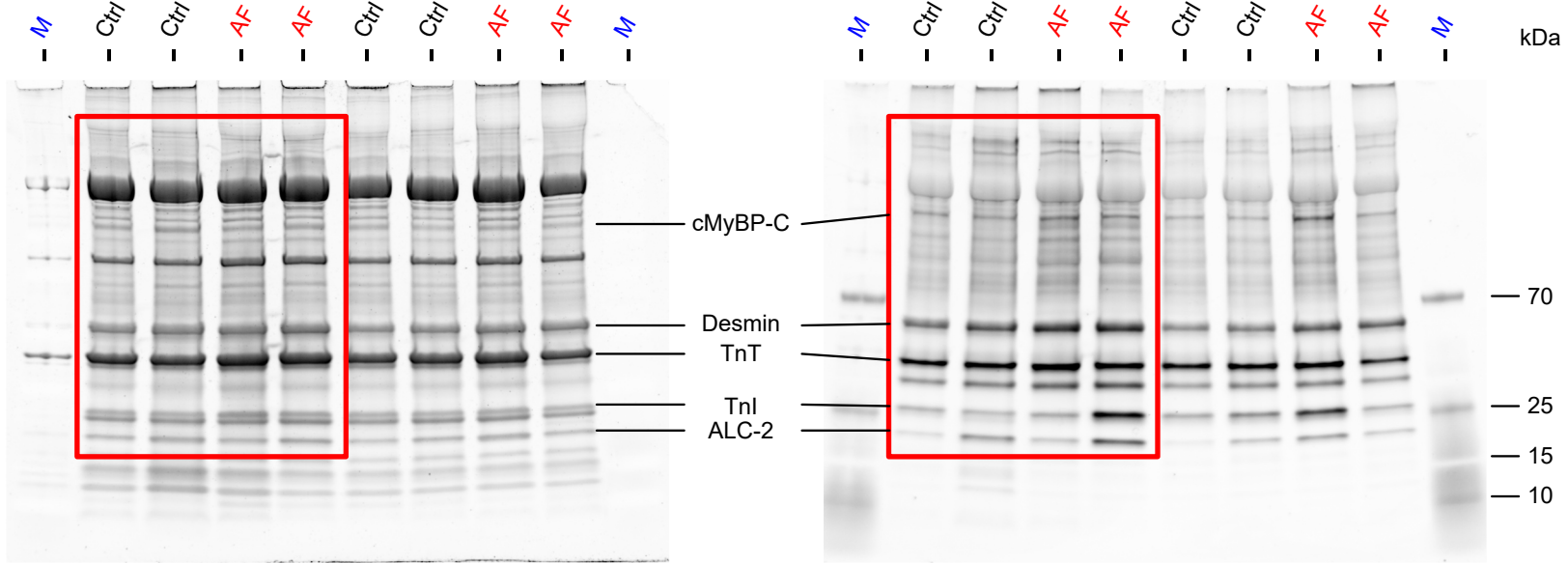
**Full unedited gels for Figure S6**

cMyBP-C  
Desmin  
cTnT  
cTnI  
ALC-2

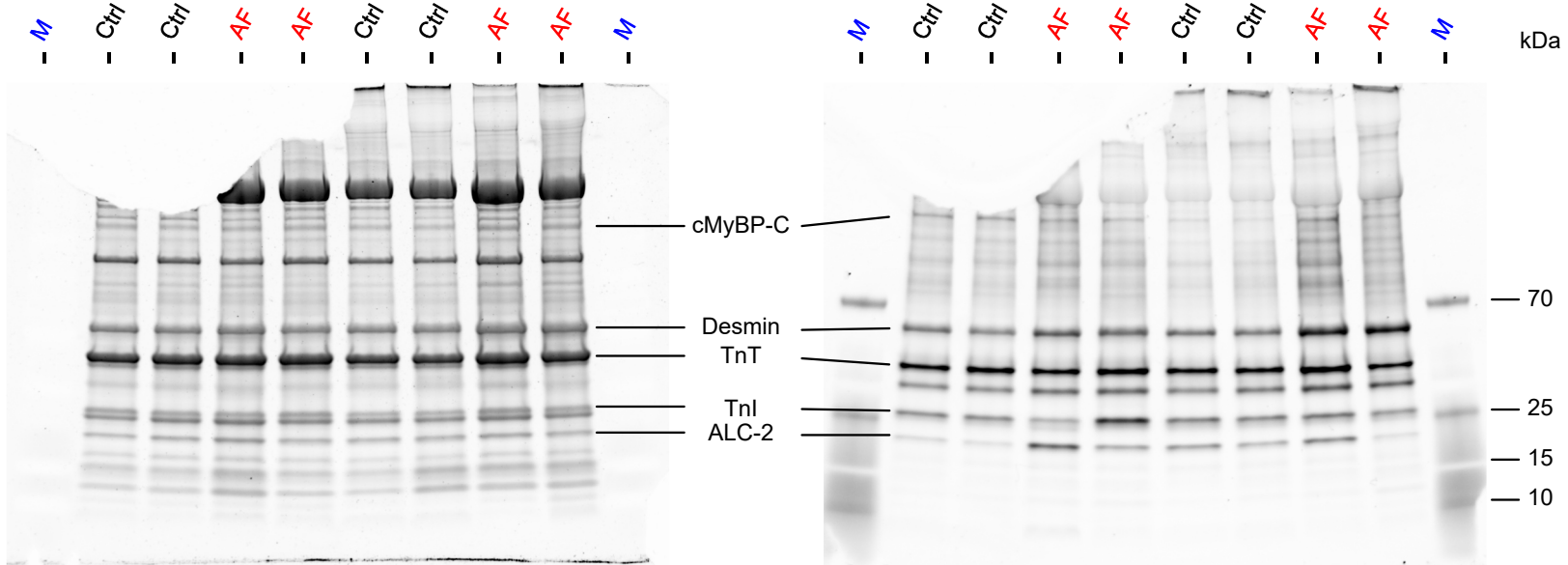
**SYPRO**

**PRO-Q**

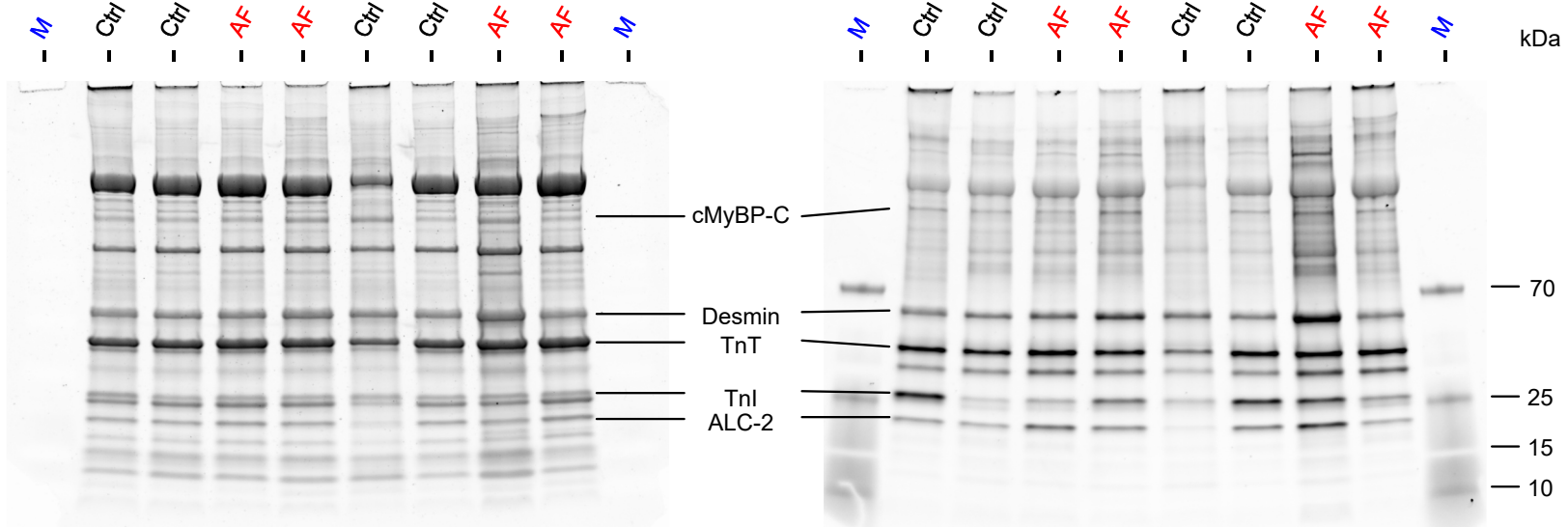
**Gel 1**



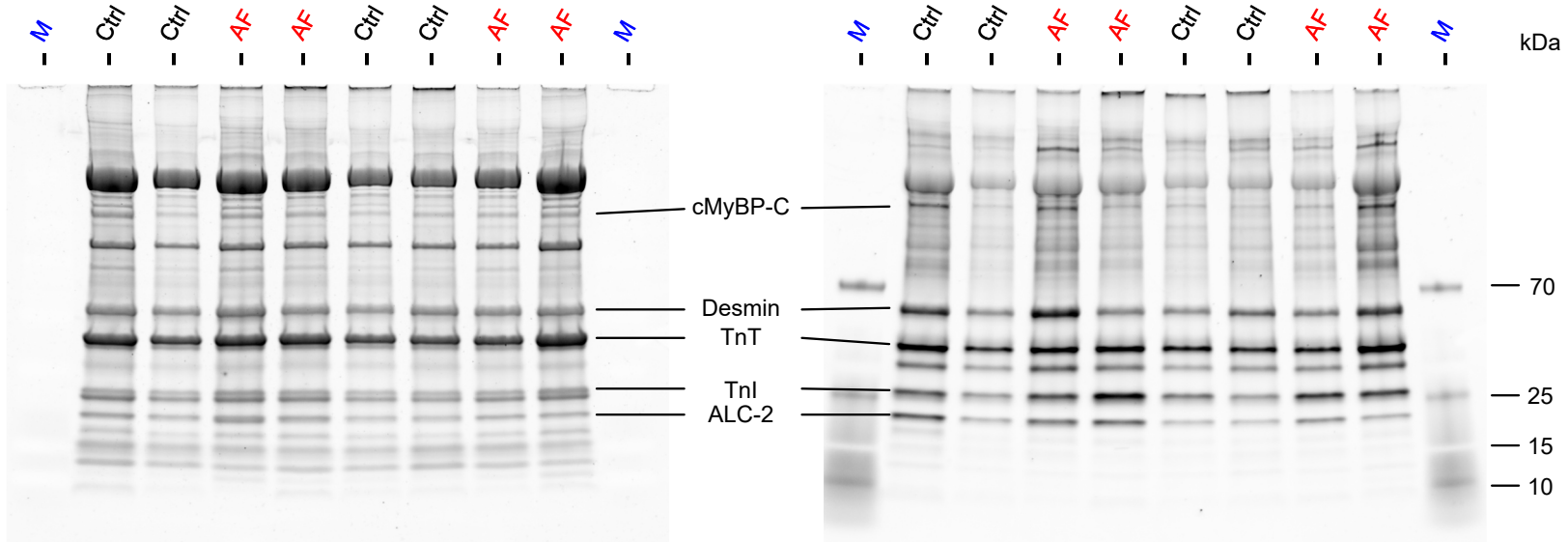
**Gel 2**



**Gel 3**



**Gel 4**



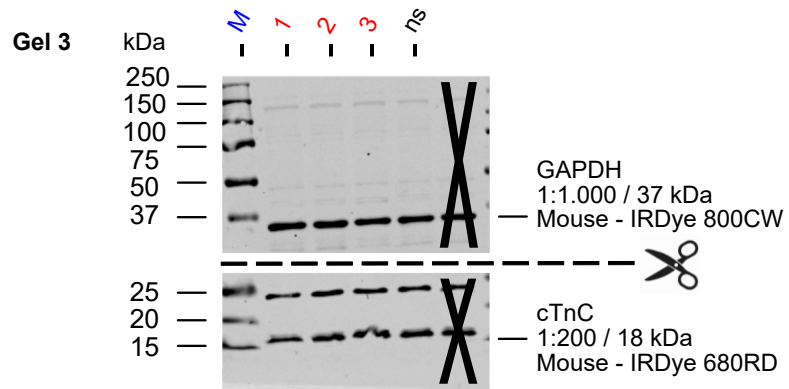
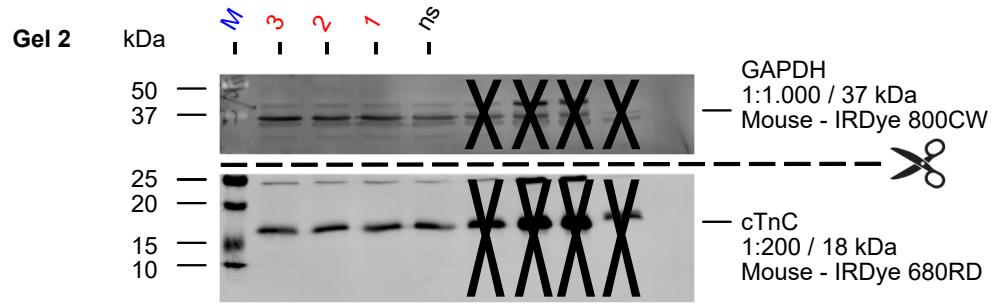
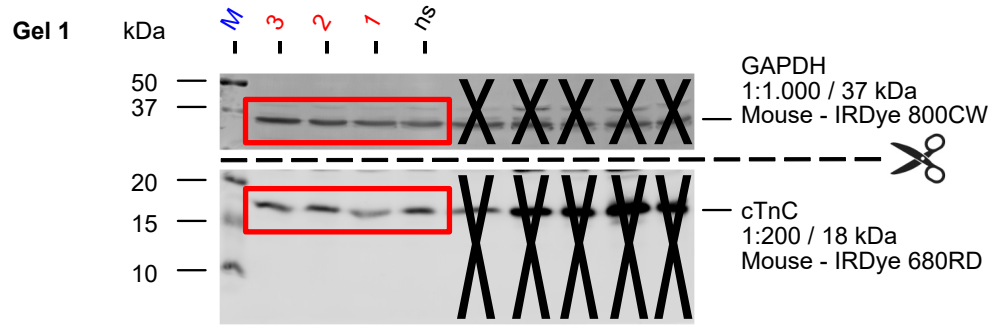
**M** = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa

**Ctrl** = Sinus rhythm

**AF** = Persistent atrial fibrillation

# Full unedited gels for Figure S8C

cTnC  
GAPDH

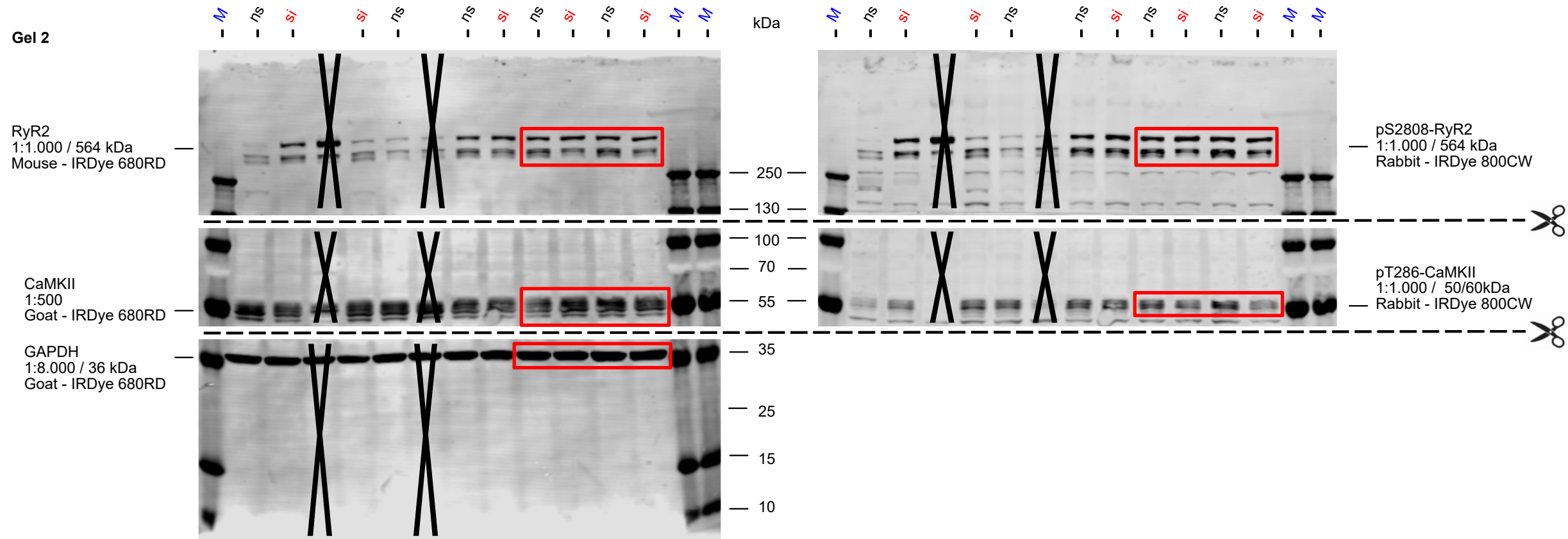


M = Precision Plus Protein™ All Blue Prestained Protein Standard  
ns = non-silencing

1 = silencing RNA 1 (ID: s14273)  
2 = silencing RNA 2 (ID: s224742)  
3 = silencing RNA 3 (ID: s224743)

**Full unedited gels for Figure S12A**

RyR2  
 pS2808-RyR2  
 CaMKII  
 pT286-CaMKII  
 GAPDH

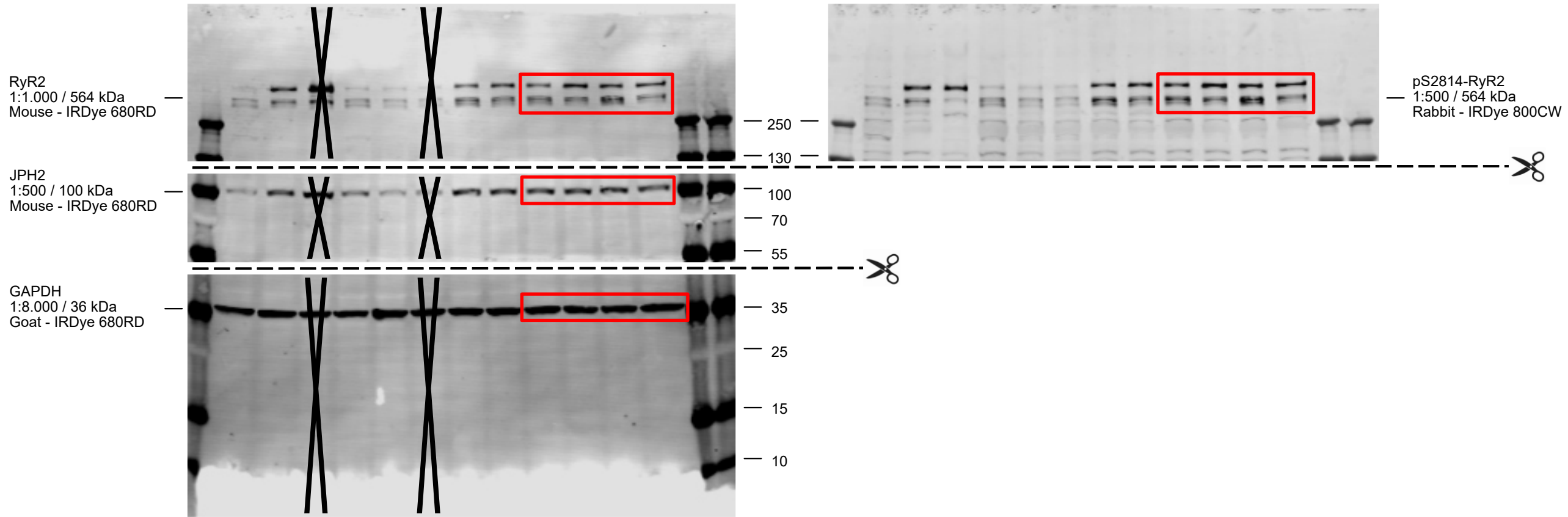


M = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa  
 ns = non-silencing  
si = silencing RNA 1 (ID: s14273)

**Full unedited gels for Figure S12B**

RyR2  
pS2814-RyR2  
JPH2  
GAPDH

**Gel 1**



**M** = Thermo Scientific™ PageRuler™ Plus Prestained Protein Ladder, 10 - 250 kDa

**ns** = non-silencing

**si** = silencing RNA 1 (ID: s14273)