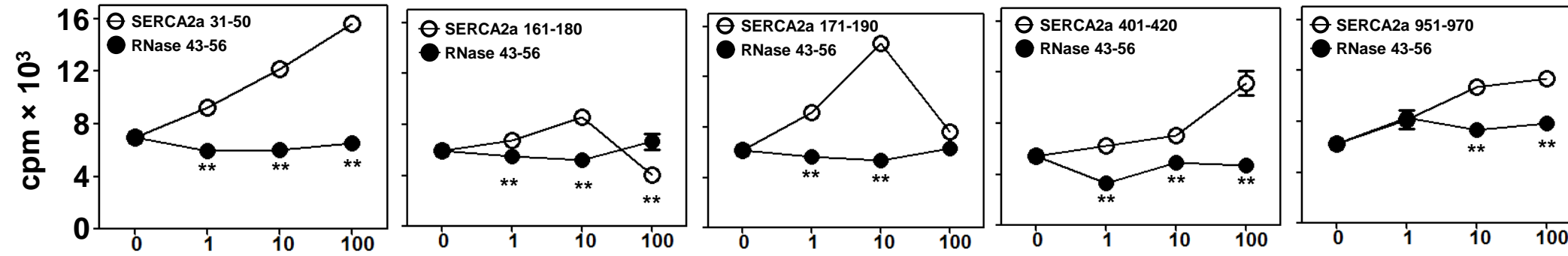
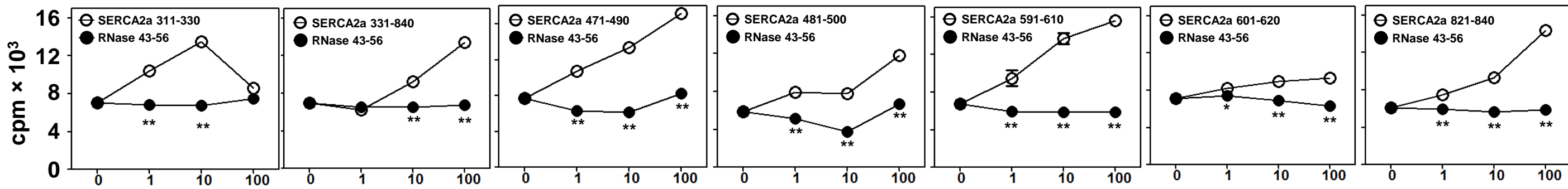


Figure S1: Evaluation of cardiac abnormalities by MRM imaging. A/J mice were immunized with or without SERCA2a 971-990, and on days, 38-39 post-immunization, animals were subjected to MRM imaging as described in the methods section. Comparisons were made between healthy and immunized mice with respect to structural (LV valve thickness, left panel) and functional parameters (right panel: end diastolic volume, end systolic volume, ejection fraction, and stroke volume) (n= 2 to 3 mice per group). * $p \leq 0.05$.

a) SERCA2a peptides that induce T cell responses, but with mild disease



b) SERCA2a peptides that induce T cell responses, but not disease



c) Cytokines production of SERCA2a peptides that induce mild disease

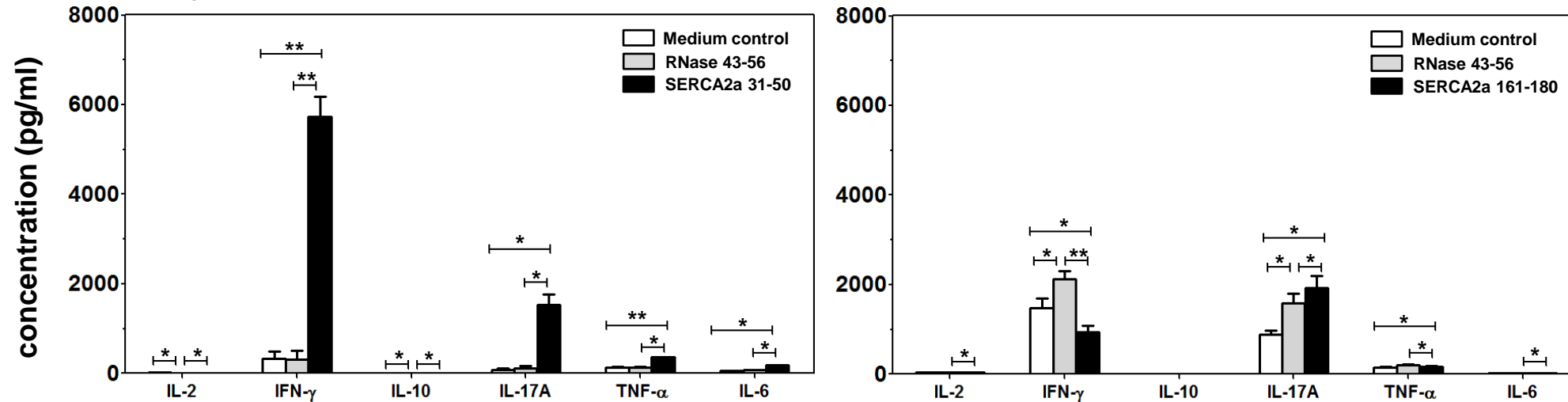


Figure S2: SERCA2a peptides that induce differential T cell and cytokine responses, but with mild or no disease. LNCs harvested from A/J mice immunized with the indicated peptides were stimulated with their corresponding, specific peptides or RNase 43-56 (control) for two days. After pulsing with 3[H]-thymidine for 16 hours, proliferative responses were measured as cpm. Top panel denotes peptides that induced mild disease, whereas in the middle panel, responses to peptides that induced no disease are shown. Bottom panel represents cytokine analysis in the supernatant obtained from cultures stimulated with or without SERCA2a 31-50 or SERCA2a 161-180 or control (RNase 43-56) peptide. Mean \pm SEM values representing from two to three individual experiments, each involving 2 to 3 mice are shown. *p < 0.05, **p < 0.01.

Table S1: SERCA2a overlapping peptide library

Peptides	Sequence
SERCA2a 1-20	MENAHTKTVEEVLGHFGVNE
SERCA2a 11-30	EVLGHFGVNESTGLSLEQVK
SERCA2a 21-40	STGLSLEQVKKLKERWGSNE
SERCA2a 31-50	KLKERWGSNELPAEEGKTLL
SERCA2a 41-60*	LPAEEGKTLELVIEQFEDL
SERCA2a 51-70*	ELVIEQFEDLLVRILLAAC
SERCA2a 61-80*	LVRILLAACISFVLAWFEE
SERCA2a 71-90*	ISFVLAWFEEGEETITAFVE
SERCA2a 81-100*	GEETITAFVEPFVILLILVA
SERCA2a 91-110	PFVILLILVANAIVGWQER
SERCA2a 101-120**	NAIVGWQERNAENAIEALK
SERCA2a 111-130	NAENAIEALKEYEPENMGKVV
SERCA2a 121-140	EYEPENMGKVYRQDRKSVQRI
SERCA2a 131-150	RQDRKSVQRIKAKDIVPGDI
SERCA2a 141-160	KAKDIVPGDIVEIAVGDKVP
SERCA2a 151-170	VEIAVGDKVPADIRLTSIKS
SERCA2a 161-180**	ADIRLTSIKSTTLRVDQSIL
SERCA2a 171-190	TTLRVDQSILTGESVSVIKH
SERCA2a 181-200	TGESVSVIKHTDPVDPRAV
SERCA2a 191-210	TDPVDPRAVNQDKKNMLFS
SERCA2a 201-220	NQDKKNMLFSGTNIAAGKAM
SERCA2a 211-230**	GTNIAAGKAMGVVATGVNT
SERCA2a 221-240**	GVVATGVNTEIGKIRDEM
SERCA2a 231-250	EIGKIRDEMVAEQERTPLQ
SERCA2a 241-260	ATEQERTPLQKLDEFGEQL
SERCA2a 251-270	QKLDEFGEQLSKVISLICIA
SERCA2a 261-280**	SKVISLICIAVWIINIGHFN
SERCA2a 271-290**	VWIINIGHFNDPVHGGSWIR
SERCA2a 281-300**	DPVHGGSWIRGAIYYFKIAV
SERCA2a 291-310	GAIYYFKIAVALAVAAIPEG
SERCA2a 301-320	ALAVAAIPEGLPAVITTCLA
SERCA2a 311-330	LPAVITTCLALGTRRMAKKN
SERCA2a 321-340	LGTRRMAKKNAIVRSLPSVE
SERCA2a 331-350	AIVRSLPSVETLGCTSVICS
SERCA2a 341-360*	TLGCTSVICSDKTGTLTTNQ
SERCA2a 351-370	DKTGTLTTNQMSVCRMFIELD
SERCA2a 361-380	MSVCRMFIELDKVEGDTCSLN
SERCA2a 371-390*	KVEGDTCSLNEFSITGSTYA
SERCA2a 381-400	EFSITGSTYAPIGEVQKDDK
SERCA2a 391-410	PIGEVQKDDKPKVCHQYDGL
SERCA2a 401-420	PKVCHQYDGLVELATICALC
SERCA2a 411-430	VELATICALCNDSDALDYNEA
SERCA2a 421-440	NDSALDYNEAKGVYEKVGEA
SERCA2a 431-450	KGVEYEKVGEEATETALTCLVE
SERCA2a 441-460	TETALTCLVEKMNVDTELK
SERCA2a 451-470	KMNVDTELKGLSKIERANA
SERCA2a 461-480	GLSKIERANACNSVIKQLMK
SERCA2a 471-490	CNSVIKQLMKKEFTLEFSRD
SERCA2a 481-500	KEFTLEFSRDRKSMSVYCTP
SERCA2a 491-510	RKSMSVYCTPNKPSRTSMSK
SERCA2a 501-520	NKPSRTSMSKMFVKGAPGEGV
SERCA2a 511-530	MFVKGAPGEGVIDRCTHIRVG
SERCA2a 521-540	IDRCTHIRVGSTKVPMTPGV
SERCA2a 531-550	STKVPMTPGVKQKIMSVIRE

SERCA2a 541-560	KQKIMSVIREWGS S DTLRC
SERCA2a 551-570**	WGS S DTLRCLALATHDNPL
SERCA2a 561-580	LALATHDNPLKREEMHLED S
SERCA2a 571-590	KREEMHLED SANFIKYETNL
SERCA2a 581-600*	ANFIKYETNLTFVGC V GMLD
SERCA2a 591-610**	TFVGC V GMLDPPRIEVASSV
SERCA2a 601-620	PPRIEVASSV KLCRQAGIRV
SERCA2a 611-630	KLCRQAGIRVIMITGDNKGT
SERCA2a 621-640	IMITGDNKGTAVAICRRIGI
SERCA2a 631-650	AVAICRRIGIFGQDEDVTSK
SERCA2a 641-660	FGQDEDVTSK AFTGREFDEL
SERCA2a 651-670	AFTGREFDELSPSAQRDA CL
SERCA2a 661-680	SPSAQRDA CLNARCFARVEP
SERCA2a 671-690	NARCFARVEPSHKSKIVEFL
SERCA2a 681-700	SHKSKIVEFLQSFDEITAMT
SERCA2a 691-710	QSFDEITAMTGDGVNDAPAL
SERCA2a 701-720	GDGVNDAPALKKSEIGIAMG
SERCA2a 711-730*	KKSEIGIAMGSGTAVAKTAS
SERCA2a 721-740	SGTAVAKTASEMVLADDNFS
SERCA2a 731-750*	EMVLADDNFSTIVA AVEEGR
SERCA2a 741-760*	TIVA AVEEGRAIYNNMKQFI
SERCA2a 751-770	AIYNNMKQFIRYLISSNVGE
SERCA2a 761-780*	RYLISSNVGEVVCIFLTAAL
SERCA2a 771-790*	VVCIFLTAALGFPEALIPVQ
SERCA2a 781-800*	GFPEALIPVQLLWVNLVTDG
SERCA2a 791-810	LLWVNLVTDGLPATALGFNP
SERCA2a 801-820	LPATALGFNPPDLDIMNKPP
SERCA2a 811-830	PDLDIMNKPPRNPKEPLISG
SERCA2a 821-840**	RNPKEPLISGWLFFRYLAIG
SERCA2a 831-850*	WLFFRYLAIGCYVGAATVGA
SERCA2a 841-860*	CYVGAATVGA AAWWFIAADG
SERCA2a 851-870**	AAWWFIAADGGPRVSFYQLS
SERCA2a 861-880**	GPRVSFYQLSHFLQCKEDNP
SERCA2a 871-890**	HFLQCKEDNP DFDGVDC AIF
SERCA2a 881-900**	DFDGVDC AIFESPYPMTMAL
SERCA2a 891-910*	ESPYPMTMALSVLVTIEMCN
SERCA2a 901-920*	SVLVTIEMCNALNSLSENQS
SERCA2a 911-930	ALNSLSENQSLLRMPPWENI
SERCA2a 921-940	LLRMPPWENIWL VGSICLSM
SERCA2a 931-950*	WL VGSICLSMSLHFLILYVE
SERCA2a 941-960	SLHFLILYVEPLPLIFQITP
SERCA2a 951-970	PLPLIFQITPLNLTQWLMVL
SERCA2a 961-980	LNLTQWLMVLKISLPVILMD
SERCA2a 971-990	KISLPVILMDETLKFVARNY
SERCA2a 981-998	ETLKFVARNYLEQPAILE

*could not be synthesized

**needed addition of DMSO to be within 0.1% in the cell culture

Table S2: The list of pools of SERCA2a peptides used to evaluate myocarditogenicity in A/J mice

Pools	Peptides	T cell responses*	Incidence (%)	Inflammatory foci [†]
I	SERCA2a 1-20	1.64	1/5 (20)	68.0 ± 0.00
	SERCA2a 11-30	1.74		
	SERCA2a 21-40	1.10		
	SERCA2a 31-50	2.10		
	RNase 43-56 (control)	1.17		
II	SERCA2a 91-110	1.72	0/5 (0)	0
	SERCA2a 101-120	1.52		
	SERCA2a 111-130	1.31		
	SERCA2a 121-140	1.40		
	SERCA2a 131-150	1.40		
	RNase 43-56 (control)	1.24		
III	SERCA2a 141-160	1.68	2/5 (40)	16.00 ± 5.00
	SERCA2a 151-170	1.65		
	SERCA2a 161-180	2.74		
	SERCA2a 171-190	3.52		
	SERCA2a 181-200	1.32		
	RNase 43-56 (control)	1.41		
IV	SERCA2a 191-210	1.25	0/5 (0)	0
	SERCA2a 201-220	1.56		
	SERCA2a 211-230	1.56		
	SERCA2a 221-240	1.87		
	SERCA2a 231-250	1.40		
	RNase 43-56 (control)	1.11		
V	SERCA2a 241-260	0.84	0/5 (0)	0
	SERCA2a 251-270	1.63		
	SERCA2a 261-280	1.17		
	SERCA2a 271-290	0.98		
	SERCA2a 281-300	1.95		
	RNase 43-56 (control)	1.31		
VI	SERCA2a 291-310	1.14	2/5 (40)	1.50 ± 0.50
	SERCA2a 301-320	1.24		
	SERCA2a 311-330	1.54		
	SERCA2a 321-340	1.16		
	SERCA2a 331-350	1.64		
	RNase 43-56 (control)	1.13		
VII	SERCA2a 351-370	1.25	4/5 (80)	1.25 ± 0.25
	SERCA2a 361-380	1.04		
	SERCA2a 381-400	1.22		
	SERCA2a 391-410	1.43		
	SERCA2a 401-420	3.61		

	RNase 43-56 (control)	1.49		
VIII	SERCA2a 411-430	1.06		
	SERCA2a 421-440	0.99		
	SERCA2a 431-450	0.91	0/5 (0)	0
	SERCA2a 441-460	1.50		
	SERCA2a 451-470	1.27		
	RNase 43-56 (control)	1.63		
IX	SERCA2a 461-480	1.24		
	SERCA2a 471-490	2.17		
	SERCA2a 481-500	1.71	4/5 (80)	2.75 ± 1.81
	SERCA2a 491-510	1.14		
	SERCA2a 501-520	1.51		
	RNase 43-56 (control)	1.08		
X	SERCA2a 511-530	1.45		
	SERCA2a 521-540	1.30		
	SERCA2a 531-550	1.26	0/5 (0)	0
	SERCA2a 541-560	1.81		
	SERCA2a 551-570	0.99		
	RNase 43-56 (control)	0.89		
XI	SERCA2a 561-580	1.26		
	SERCA2a 571-590	1.85	2/5 (40)	1.0 ± 0.00
	SERCA2a 591-610	2.25		
	SERCA2a 601-620	4.10		
	RNase 43-56 (control)	1.11		
XII	SERCA2a 611-630	1.10		
	SERCA2a 621-640	1.52	1/5 (20)	7.0 ± 0.00
	SERCA2a 631-650	1.28		
	SERCA2a 641-660	1.42		
	RNase 43-56 (control)	1.18		
XIII	SERCA2a 651-670	1.03		
	SERCA2a 661-680	1.30	0/5 (0)	0
	SERCA2a 671-690	1.42		
	SERCA2a 681-700	1.25		
	RNase 43-56 (control)	1.04		
XIV	SERCA2a 691-710	1.29		
	SERCA2a 701-720	0.90	0/5 (0)	0
	SERCA2a 721-740	1.57		
	SERCA2a 751-770	1.39		
	RNase 43-56 (control)	1.35		
XV	SERCA2a 791-810	1.53		
	SERCA2a 801-820	0.97	1/5 (20)	5.0 ± 0.00
	SERCA2a 811-830	1.17		
	SERCA2a 821-840	2.17		
	RNase 43-56 (control)	1.22		

XVI	SERCA2a 851-870	1.73	0/5 (0)	0
	SERCA2a 861-880	1.30		
	SERCA2a 871-890	1.24		
	SERCA2a 881-900	1.27		
	RNase 43-56 (control)	1.19		
XVII	SERCA2a 911-930	1.15	1/5 (20)	2.0 ± 0.00
	SERCA2a 921-940	0.86		
	SERCA2a 941-960	1.10		
	SERCA2a 951-970	1.70		
	RNase 43-56 (control)	1.15		
XVIII	SERCA2a 961-980	1.29	4/5 (80)	9.75 ± 7.13
	SERCA2a 971-990	2.86		
	SERCA2a 981-998	1.69		
	RNase 43-56 (control)	1.19		

RNase 43-56, control for T cell responses; *fold difference in T cell responses are shown;

†represents mean ± SEM values derived from myocarditic animals