

**SUPPLEMENTAL TABLE(S)**

<b>Table S1. Apparent affinities of RTA mAbs used in this study</b>			
<b>mAb</b>	<b>Ka(1/Ms)<sup>a</sup></b>	<b>Kd(1/s)</b>	<b>KD (M)</b>
PB10	1.01X10 <sup>6</sup>	1.25X10 <sup>-6</sup>	1.24X10 <sup>-12</sup>
WECB2	1.13X10 <sup>6</sup>	3.50X10 <sup>-6</sup>	3.10X10 <sup>-12</sup>
R70	7.20X10 <sup>5</sup>	1.39X10 <sup>-5</sup>	1.94X10 <sup>-11</sup>
SyIH7	4.15X10 <sup>5</sup>	8.44X10 <sup>-6</sup>	2.03X10 <sup>-11</sup>
PA1	8.61X10 <sup>5</sup>	7.92X10 <sup>-6</sup>	9.19X10 <sup>-12</sup>
PH12	9.56X10 <sup>5</sup>	8.70X10 <sup>-6</sup>	9.10X10 <sup>-12</sup>
TB12	6.14X10 <sup>5</sup>	2.71X10 <sup>-5</sup>	4.42X10 <sup>-11</sup>
IB2	2.71X10 <sup>6</sup>	1.33X10 <sup>-4</sup>	4.93X10 <sup>-11</sup>
GD12	2.22X10 <sup>5</sup>	1.22X10 <sup>-5</sup>	5.52X10 <sup>-11</sup>
JD4	3.02X10 <sup>4</sup>	2.47X10 <sup>-5</sup>	8.18X10 <sup>-10</sup>

<sup>a</sup>, apparent binding association ( $k_a$ ) and dissociation ( $k_d$ ) rate constants, as well as apparent equilibrium dissociation constants ( $K_D$ ), were determined by surface plasmon resonance (SPR) using a the ProteOn XPR36 (Bio-Rad Inc., Hercules, CA). Apparent affinities were determined using IgG molecules, not Fab fragments with ricin toxin-coated GLC chips. Kinetic constants for the antibody/ricin interactions were fitted using the Langmuir 1:1 binding model available in the ProteOn Manager software 3.1.0 (Bio-Rad Inc.). The values shown here supersede previously reported kinetic values obtained using Biacore instrumentation.

**Table S2. RiVax peptic peptides**

Amino acid residue #			Amino acid residue #			Amino acid residue #			Amino acid residue #		
Pep #	start	end	Pep #	start	end	Pep #	start	end	Pep #	start	end
<b>1</b>	1	11	<b>36</b>	92	103	<b>71</b>	162	168	<b>106</b>	217	232
<b>2</b>	12	20	<b>37</b>	92	107	<b>72</b>	165	168	<b>107</b>	217	240
<b>3</b>	12	24	<b>38</b>	93	99	<b>73</b>	165	171	<b>108</b>	218	225
<b>4</b>	21	24	<b>39</b>	93	107	<b>74</b>	168	171	<b>109</b>	218	232
<b>5</b>	25	32	<b>40</b>	102	107	<b>75</b>	169	173	<b>110</b>	220	232
<b>6</b>	25	37	<b>41</b>	103	107	<b>76</b>	172	181	<b>111</b>	221	232
<b>7</b>	28	37	<b>42</b>	104	107	<b>77</b>	175	181	<b>112</b>	226	232
<b>8</b>	33	59	<b>43</b>	104	109	<b>78</b>	178	181	<b>113</b>	226	240
<b>9</b>	37	59	<b>44</b>	108	117	<b>79</b>	182	186	<b>114</b>	227	240
<b>10</b>	38	45	<b>45</b>	108	118	<b>80</b>	182	187	<b>115</b>	232	240
<b>11</b>	38	55	<b>46</b>	108	122	<b>81</b>	182	188	<b>116</b>	232	243
<b>12</b>	38	57	<b>47</b>	118	122	<b>82</b>	182	190	<b>117</b>	232	248
<b>13</b>	38	59	<b>48</b>	119	126	<b>83</b>	182	204	<b>118</b>	233	243
<b>14</b>	56	59	<b>49</b>	123	126	<b>84</b>	187	204	<b>119</b>	233	244
<b>15</b>	58	61	<b>50</b>	123	129	<b>85</b>	188	204	<b>120</b>	233	246
<b>16</b>	58	68	<b>51</b>	123	133	<b>86</b>	189	204	<b>121</b>	233	248
<b>17</b>	60	68	<b>52</b>	123	135	<b>87</b>	189	206	<b>122</b>	240	243
<b>18</b>	60	69	<b>53</b>	127	133	<b>88</b>	191	204	<b>123</b>	241	244
<b>19</b>	62	68	<b>54</b>	127	135	<b>89</b>	191	207	<b>124</b>	241	246
<b>20</b>	69	72	<b>55</b>	130	135	<b>90</b>	195	204	<b>125</b>	241	248
<b>21</b>	69	73	<b>56</b>	130	151	<b>91</b>	205	210	<b>126</b>	243	248
<b>22</b>	69	74	<b>57</b>	133	144	<b>92</b>	205	214	<b>127</b>	244	248
<b>23</b>	70	74	<b>58</b>	134	146	<b>93</b>	205	216	<b>128</b>	245	248
<b>24</b>	72	79	<b>59</b>	134	151	<b>94</b>	205	217	<b>129</b>	247	253
<b>25</b>	72	91	<b>60</b>	136	146	<b>95</b>	207	214	<b>130</b>	247	254
<b>26</b>	73	79	<b>61</b>	136	147	<b>96</b>	207	216	<b>131</b>	247	255
<b>27</b>	73	91	<b>62</b>	136	151	<b>97</b>	207	217	<b>132</b>	249	253
<b>28</b>	75	79	<b>63</b>	146	150	<b>98</b>	208	214	<b>133</b>	249	254
<b>29</b>	75	91	<b>64</b>	147	150	<b>99</b>	208	216	<b>134</b>	249	255
<b>30</b>	80	91	<b>65</b>	147	151	<b>100</b>	208	217	<b>135</b>	255	267
<b>31</b>	80	92	<b>66</b>	148	151	<b>101</b>	211	216	<b>136</b>	256	267
<b>32</b>	84	91	<b>67</b>	152	161	<b>102</b>	211	217	<b>137</b>	257	267
<b>33</b>	92	99	<b>68</b>	152	164	<b>103</b>	212	216	<b>138</b>	258	267
<b>34</b>	92	101	<b>69</b>	153	164	<b>104</b>	217	220			
<b>35</b>	92	102	<b>70</b>	162	167	<b>105</b>	217	225			

## SUPPLEMENTAL FIGURE LEGENDS

**Figure S1: Heat map representation of cross-competition ELISA with panel of murine RTA-specific mAbs.** As described in the Materials and Methods, the panel of 10 RTA-specific murine mAbs were subjected to cross competition ELISAs. The capture mAbs (vertical axis) were coated onto 96 well microtiter plates then assessed for the ability to capture biotin-tagged ricin in the presence of competitor mAbs (horizontal axis). The percent (%) inhibition of biotin-ricin binding to the capture mAb in the presence of a competitor mAb was calculated from the optical density (OD) values as follows:  $1 - \frac{\text{value OD}_{450} (\text{biotin-ricin} + \text{competitor mAb})}{\text{value OD}_{450} (\text{biotin-ricin without competitor mAb})} \times 100$ . The values were translated to a heat map using Prism 7 (GraphPad). The scale bar on the right indicates percent inhibition from black (0%) to dark red (100%). The heat map is presented as a means of visualizing the relative competition groups or clusters (I-IV) referred to in the body of the manuscript.

**Figure S2. Positioning WECEB2's epitope on RiVax.** Intermediate regions of protection associated with WECEB2 binding to RiVax, as in Figure 3. The side chains of amino acid residues associated with strong (dark blue) intermediate protection by WECEB2 are shown as sticks. The side chains from intermediate protected residues that could contact the strongly protected region based on proximity (<1 angstrom) are colored red.  $\alpha$ -helix B and  $\beta$ -strand h are labelled.



FIGURE 2

