

## Supplementary file

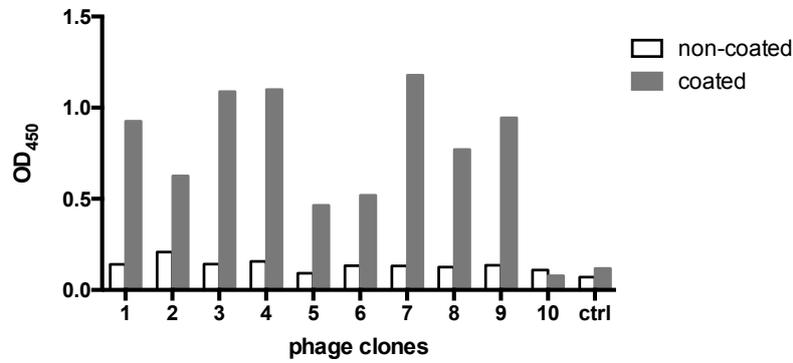
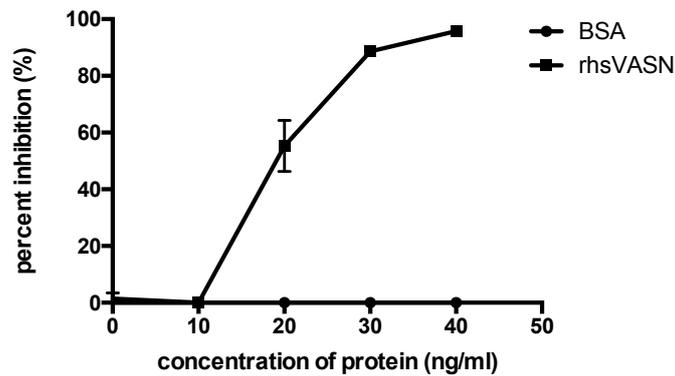


Figure S1. Affinity and specificity of isolated phage clones against the VASN antibodies. ELISA assays of isolated phage clones binding with the antibody V20. ctrl: the peptide library.

A



B

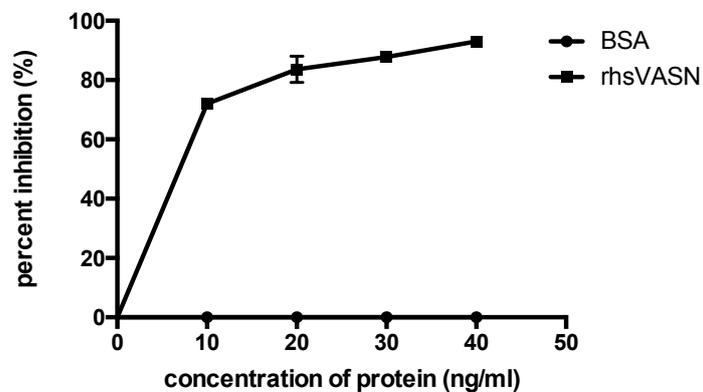


Figure S2. Competitive ELISA assays of isolated phage clones V20P1 (A) and V20P2

(B) binding with V20. rhsVASN was used to compete with the phages, taking BSA (Bovine Serum Albumin) as the negative control.

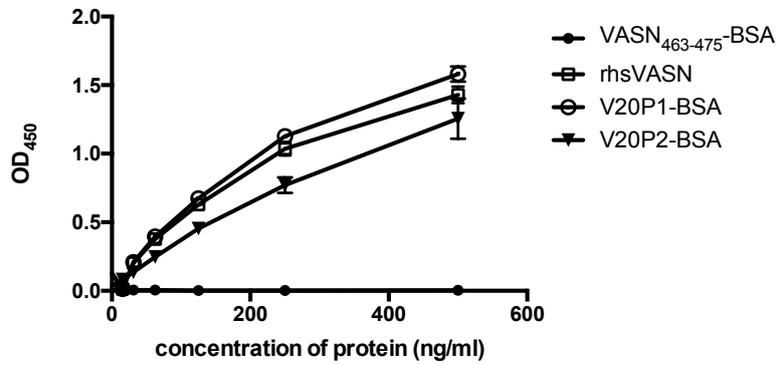


Figure S3. Affinity of synthetic mimotope peptides binding to the antibody V20. ELISA was performed to assay the peptide-BSA proteins binding with V20, taking rhsVASN as the positive control, and VASN<sub>463-475</sub>-BSA as the negative control.

**Table S1.** The enrichment procedure of peptide library screening against V20.

| Round | coated-Ab<br>( $\mu\text{g}/\text{well}$ ) | input<br>(pfu) <sup>a</sup> | output<br>sample<br>well<br>(pfu) | of<br>well | output<br>control<br>well<br>(pfu) | of<br>well | P/N<br>value |
|-------|--|-----------------------------|-----------------------------------|------------|------------------------------------|------------|--------------|
| 1     | 3.0  | $4.0 \times 10^8$           | $3.6 \times 10^4$                 |            | $2.6 \times 10^4$                  |            | 1.4          |
| 2     | 2.0  | $4.0 \times 10^8$           | $6.3 \times 10^5$                 |            | $6.8 \times 10^4$                  |            | 9            |
| 3     | 1.0  | $4.0 \times 10^8$           | $3.6 \times 10^8$                 |            | $6.0 \times 10^6$                  |            | 60           |

<sup>a</sup> pfu: plaque-forming unit

**Table S2.** Sequence alignment of peptide inserts binding with V20.

| phage clone No.   | sequence <sup>a</sup> | frequency |
|-------------------|-----------------------|-----------|
| 1                 | <i>SLLSESHPYLWL</i>   | 1         |
| 2                 | <i>HGLLLDSHPGLL</i>   | 1         |
| conserved motif 1 | <i>LLNNSHPNL</i>      |           |
| 3                 | <i>SFFLEATQSIWS</i>   | 1         |
| 4                 | <i>SFYEAQGDR LH</i>   | 2         |
| 6                 | <i>SFYTESQGSLTA</i>   | 1         |
| 7                 | <i>SGFYSSAGLPLH</i>   | 2         |
| conserved motif 2 | <i>FYNEAQQ</i>        |           |
| 9                 | <i>LPGYYSEAGNWR</i>   | 2         |

<sup>a</sup> The conserved motifs were shown in italic letters.