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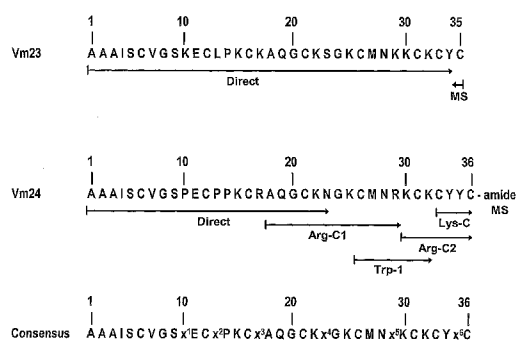
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(54) Title: VM23 AND VM24, TWO SCORPION PEPTIDES THAT BLOCK HUMAN T-LYMPHOCYTE POTASSIUM CHANNELS (SUB-TYPE KV1.3) WITH HIGH SELECTIVITY AND DECREASE THE IN VIVO DTH-RESPONSES IN RATS

Fig. 2



(57) Abstract: Potassium channels Kv1.3 are known to be implicated in immunological diseases and graft rejections. Disclosed are peptides capable of blocking with high affinity and specificity potassium channels Kv1.3, their pharmaceutical compositions, and methods for their use to block Kv1.3 potassium channels, to treat various immunological conditions and to diagnostic applications. Methods for their chemical synthesis and correct folding are also disclosed. Exemplary peptides correspond to protein components (Vm23 and Vm24) isolated from the venom of the Mexican scorpion *Vaejovis mexicanus smithi*. Vm23 and Vm24 bind to hKv1.3 channels in an almost irreversible manner, showing a K_d value in the order of 3 picomolar range, when applied to human lymphocytes cultures in vitro. Vm24 was chemically synthesized and used in in vivo experiments to successfully treat sensitized rats (on the DTH-response). Neither Vm24 nor synthetic Vm24 is toxic to mice when injected at relatively high concentrations (assayed up to 10,000 micrograms per kilogram mouse body weight). These peptides (Vm24 and Vm23) and their functional equivalent analogs with at least 83% of sequence identity are lead compounds, candidates for the treatment of various immunological conditions and diagnostic applications.

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*
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