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Two novel synthetic peptoids exhibit rapid in vitro killing of methicillin-resistant \textit{Staphylococcus pseudintermedius}

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\section*{Introduction}

\begin{itemize}
  \item Methicillin-resistant \textit{S. pseudintermedius} (MRSP) are of increasing concern due to its recent spread amongst dog populations worldwide (Perreten et al., 2010).
  \item Limited treatment options are available for MRSP, thus alternative treatment is required to combat these multidrug-resistant microorganisms in the future.
\end{itemize}

\section*{Materials and Methods}

\begin{itemize}
  \item Prior to the study, 10 newly developed peptoids were tested for their antimicrobial properties.
  \item Peptoids resemble peptides except that the side chains are appended to the nitrogen atom of the backbone rather than to the ε-carbons. They are also characterised by being more stable in vitro towards heat, salt, pH fluctuations and organic solvents compared to peptides. in vivo, peptoids are stable to proteolysis whereas peptides are rapidly degraded.
\end{itemize}

\section*{Results}

MIC determinations (Fig. 1)

\begin{itemize}
  \item Low MIC’s ranging from 1.56-6.25 μM were observed for B1 and D2. MICs did not differ between MSSP and MRSP.
  \item MICs were normally distributed – no obvious evidence of resistance in the 50 isolates tested.
\end{itemize}

Time kill kinetics (Fig 2a and 2b)

\begin{itemize}
  \item Both B1 and D2 had a concentration-dependant antimicrobial effect on \textit{S. pseudintermedius}.
  \item B1 acted more rapidly with complete killing at 4 * MIC in 30 min.
  \item D2 was slightly slower taking 2 hours to kill at 4 * MIC.
\end{itemize}

\section*{Conclusions}

\begin{itemize}
  \item Two novel peptoid compounds were shown to have a rapid concentration-dependant effect against \textit{S. pseudintermedius} of canine origin, irrespective of antibiotic resistance phenotypes.
  \item The rapid killing resembles the pharmacodynamics of antiseptics but the mechanism of action is unknown.
  \item The next step will be to test the effect and toxicity of topical formulations of the two compounds in vivo, for example in a mouse skin infection model.
\end{itemize}

\section*{References}
