ABSTRACT

TITLE:	A Green, Asymmetric Total Synthesis of the Antiviral Natural Product Sattabacin
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ABSTRACT: The sattabacins and sattazolins are fascinating natural products isolated from soil bacteria by Italian researchers. These natural products were shown to exhibit potent antiviral activity against various viruses including herpes simplex virus (HSV) type 1 and type 2 in the g/mL range. Sixty million Americans are infected with HSV-2, an incurable viral infection, and numerous studies have shown that HSV-1 infection leads to a higher risk of developing Alzheimer's disease. Due to their unknown stereochemistry and the lack of access to significant quantities for further testing of antiviral properties, the total synthesis of these compounds in the laboratory is an important goal. Within this context, a concise total synthesis of the antiviral natural product sattabacin is reported in only three chemical steps from the naturally occurring amino acid L-phenylalanine. Preparation of a Weinreb amide proceeded in two steps according to established literature precedent. Reaction of this amide with an appropriate Grignard reagent furnished the natural product sattabacin in excellent overall yield. The synthesis is extremely short and does not employ protecting groups minimizing the waste generated. By employing other Grignard reagents in the final step, the synthesis of sattabacin is also amenable to the preparation of sattabacin analogues. One analogue has already been prepared and efforts are underway to prepare additional compounds that will be screened for antiviral activity.