

# Total Synthesis of the Potent and Broad-Spectrum Antibiotics Amycolamicin and Kibdelomycin

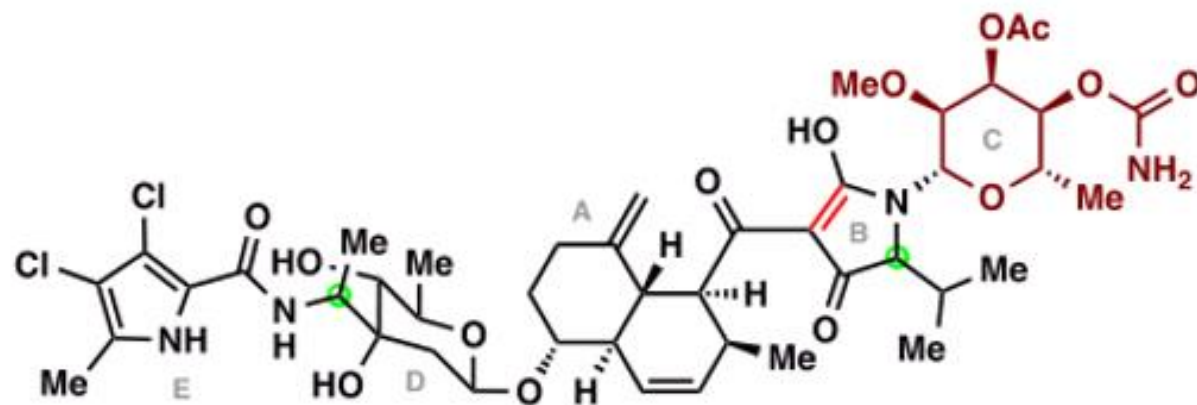
Shaoqiang Yang,<sup>§</sup> Chenglong Chen,<sup>§</sup> Jie Chen,<sup>§</sup> and Chao Li\*

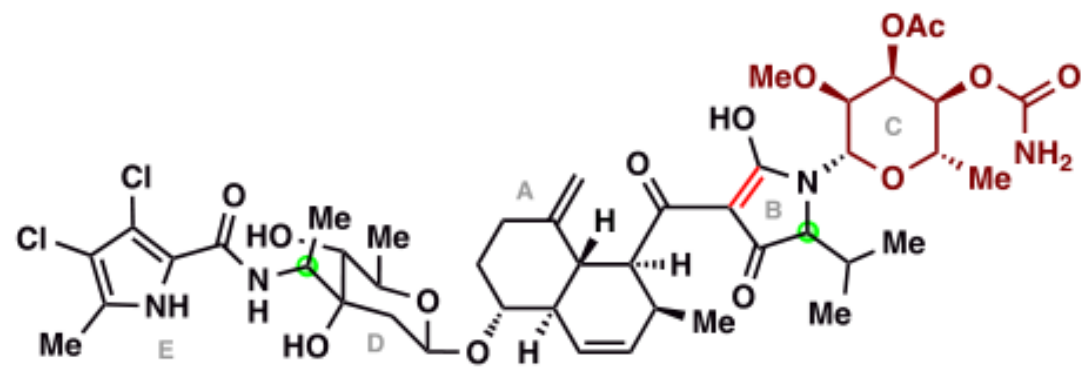


Cite This: <https://doi.org/10.1021/jacs.1c11477>

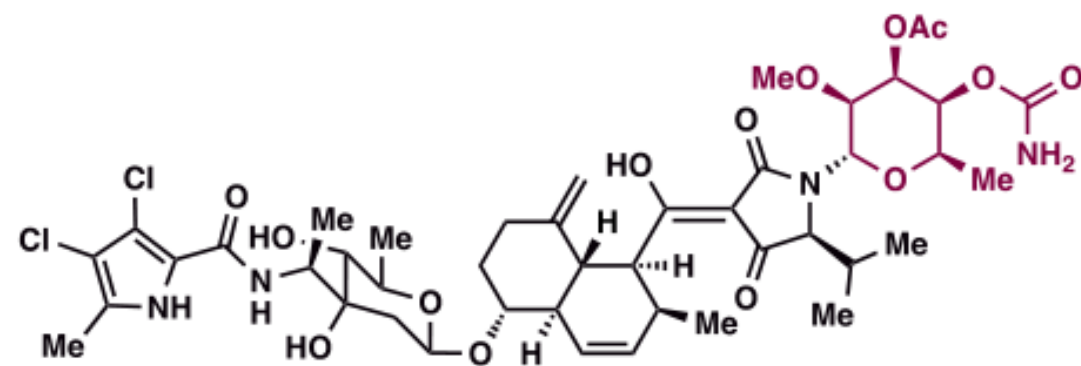


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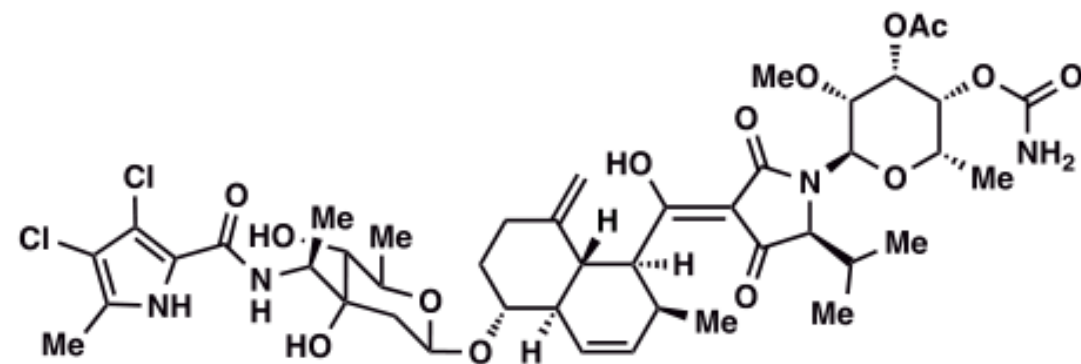




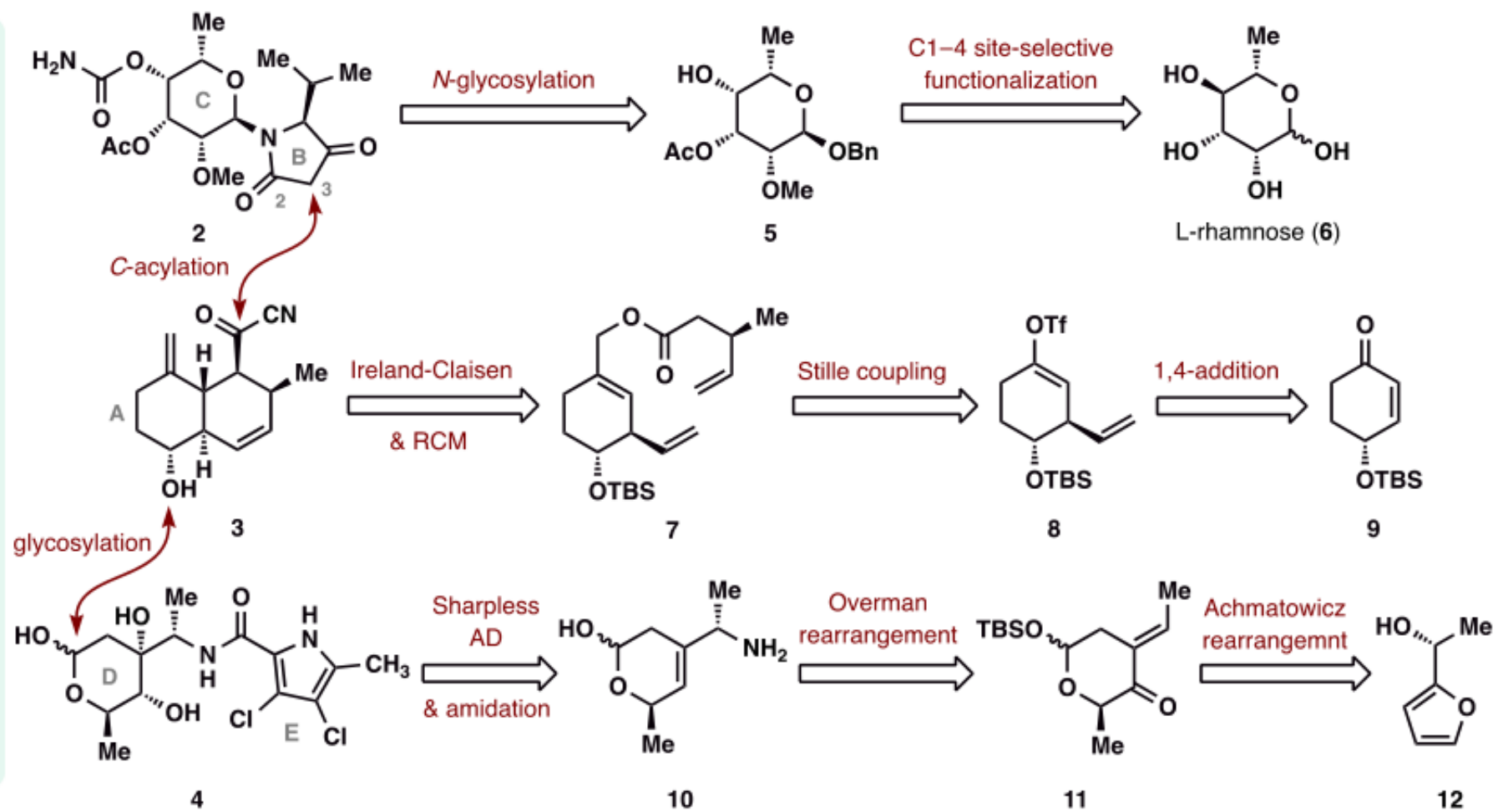
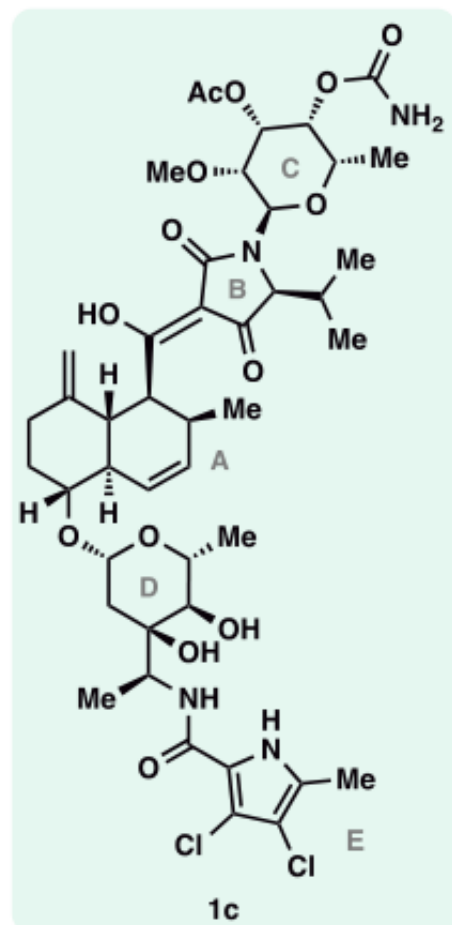
amycolamicin (**1a**, 2010, Tohyama et al.)



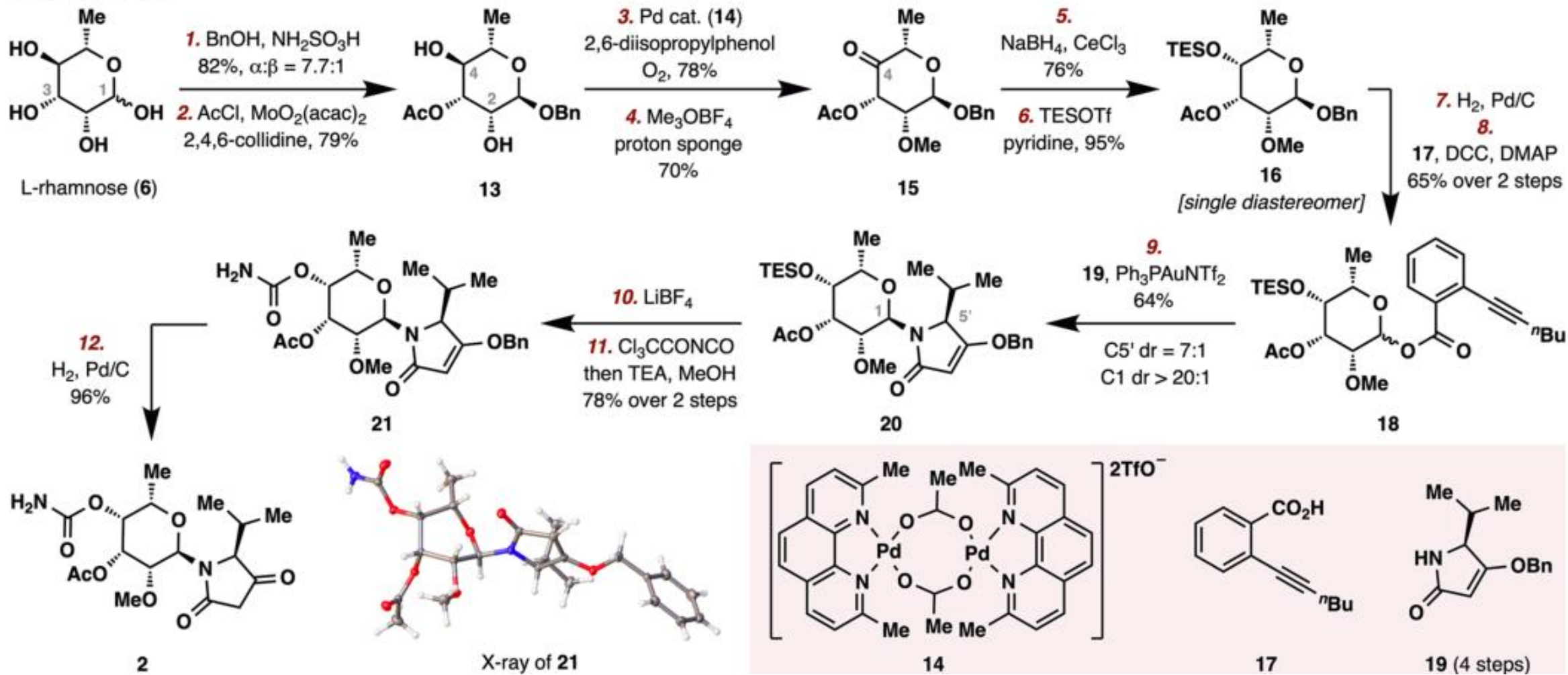
kibdelomycin (**1b**, 2011, Singh et al.)



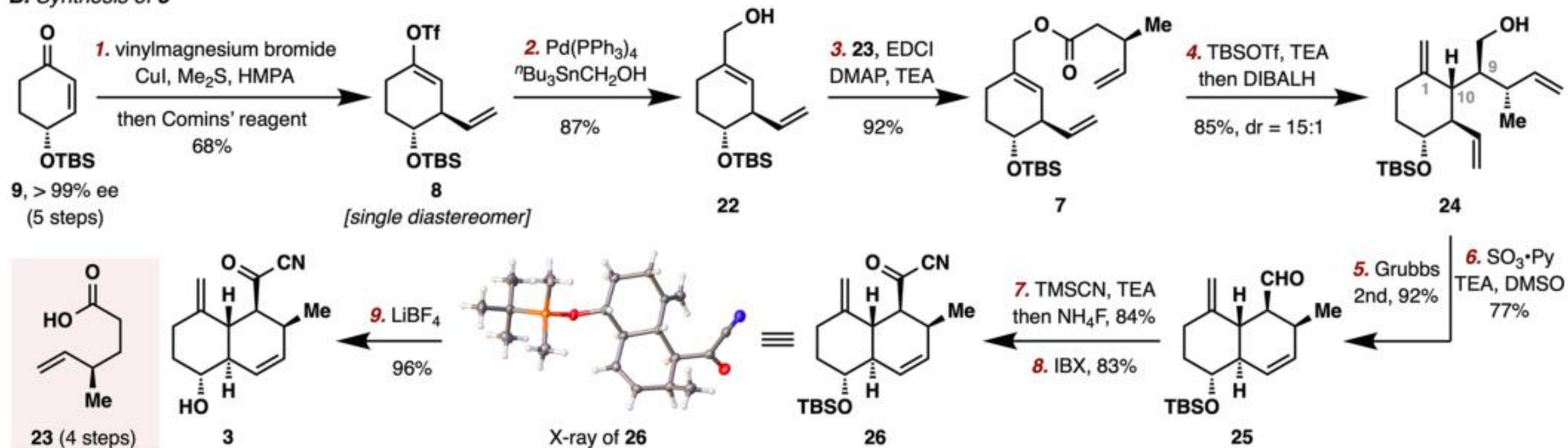
**1c**, revised structure of amycolamicin (2012, Adachi et al.)  
and kibdelomycin (2014, Singh et al.)



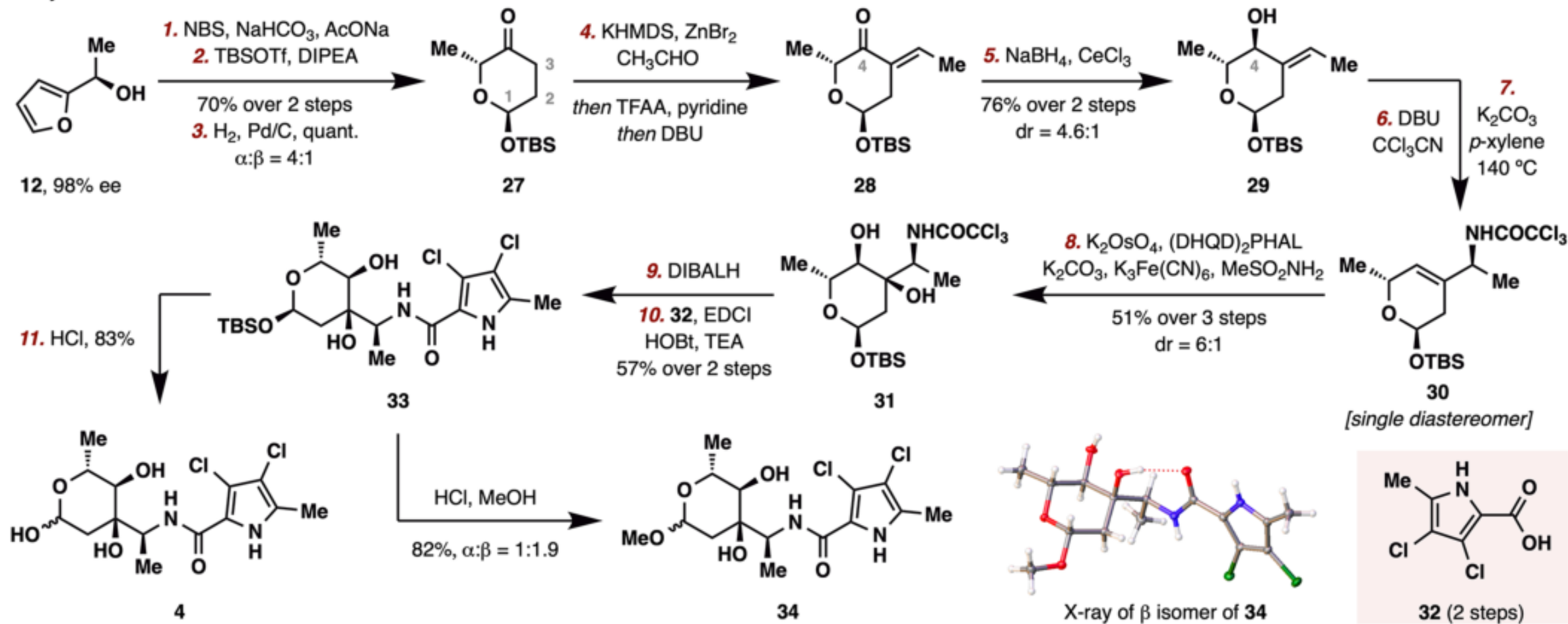
### A. Synthesis of **2**



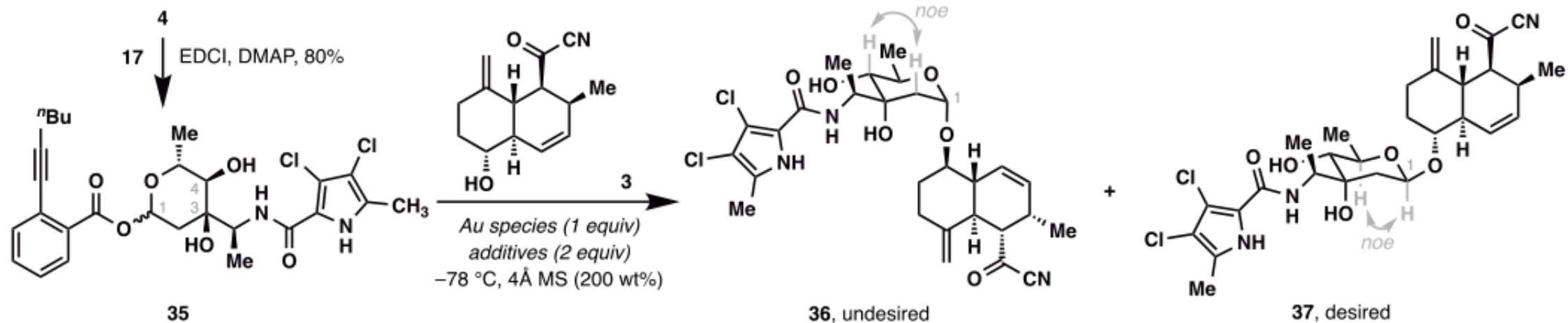
### B. Synthesis of 3



C. Synthesis of **4**







entry	Au species	additives	solvent	ratio of <b>36/37</b> <sup>a</sup>	yield <sup>b</sup>	entry	Au species	additives	solvent	ratio of <b>36/37</b> <sup>a</sup>	yield <sup>b</sup>
1	Ph <sub>3</sub> PAuNTf <sub>2</sub> <sup>c</sup>	none	CH <sub>2</sub> Cl <sub>2</sub>	>10:1	50%	7	Ph <sub>3</sub> PAuOTf	In(OTf) <sub>3</sub>	CH <sub>2</sub> Cl <sub>2</sub> /CH <sub>3</sub> CN	1:1.5	N.D.
2	Ph <sub>3</sub> PAuOTf <sup>c</sup>	none	CH <sub>2</sub> Cl <sub>2</sub>	2.2:1	N.D.	8	Ph <sub>3</sub> PAuOTf	Gd(OTf) <sub>3</sub>	CH <sub>2</sub> Cl <sub>2</sub> /CH <sub>3</sub> CN	1:3.3	53%
3	Ph <sub>3</sub> PAuOTf	none	CH <sub>2</sub> Cl <sub>2</sub>	1.4:1	N.D.	9 <sup>d</sup>	Ph <sub>3</sub> PAuOTf	Gd(OTf) <sub>3</sub>	CH <sub>3</sub> CN	1:1	N.D.
4	Ph <sub>3</sub> PAuOTf	TBSOTf	CH <sub>2</sub> Cl <sub>2</sub>	2.0:1	N.D.	10	Ph <sub>3</sub> PAuOTf	Gd(OTf) <sub>3</sub>	toluene/CH <sub>3</sub> CN	1:3.5	54%
5	Ph <sub>3</sub> PAuOTf	In(OTf) <sub>3</sub>	CH <sub>2</sub> Cl <sub>2</sub>	1:1	N.D.	<b>11<sup>e</sup></b>	<b>Ph<sub>3</sub>PAuOTf</b>	<b>Gd(OTf)<sub>3</sub></b>	<b>toluene/CH<sub>3</sub>CN</b>	<b>1:4.0</b>	<b>67%</b>
6	Ph <sub>3</sub> PAuOTf	Gd(OTf) <sub>3</sub>	CH <sub>2</sub> Cl <sub>2</sub>	1:1	N.D.	12 <sup>e</sup>	Ph <sub>3</sub> PAuOTf <sup>c</sup>	Gd(OTf) <sub>3</sub>	toluene/CH <sub>3</sub> CN	1:2.0	67%

