De No
hygro

Li Cui,

ABST

KEY

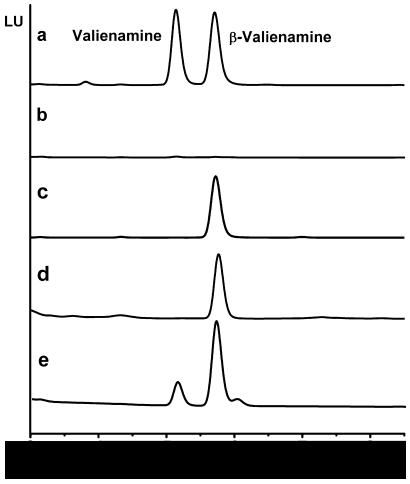

Figure 3. C ss z s O A. ( ) β- s s. ( ), z s (–), s z B, , A B, s .

s s 5 β- 76% s 12 z S / s .

s ss s (-) s , [1] O , O , ^{13}C s . / 176.0936 + $^{+}$(1 3), s O A / 374.1041 + $^{+}$(2 6), β- s O A [1] ss s s ( ) (β-) s s s , s s (δ -5 6.20 5.50 δ -1 4.16 3.27), s δ3.35 (s, 1 , -6), s ss s . s - 1 s s 9.8 z, C-2 C-6 s (4 ,). O O ssss s -2 (δ 3.50) -6, C-6 s ? - (4 ,). - , s s ss ^{13}C s (4 ,).

s B, (4) s s— ss - s (- D) s z (2).[28] B, s -s s s s - . C s s s, B, ss - s s s (2- - - s 2- -3- - - s s), s s D -4- -s s. ss , s s s B, s s . A , B, s 3.6 s , s 13- (/l) . C . s s s z 4, B, s s s

Figure 4. z s s s s A s. (C) z s β- s A s. D s s 1 / z s S , S - , 0.3 37 °C s s (7.5); ( ) s A s; 0.5 - D s s s s 5 0.5 AD .

β- s A s [20,21,29,30] s s . 5008, s s A. s β- ss, s ? 5008 s ss β- . C$_7$ s C A s s s s s . [29] O s, s C ss s s B, . , C s s D, C . [29] Δ C - 5008 72 A z C. s s s A s s (5) s Δ C (5 , 5). s , ? s 927 s A [30] Δ C . s, A- D- -B, s - s s ss β- Δ C:: ? . Δ C:: ? Δ C 50 5 s s s, β- s C O A- z 12 . As s 5 , s β- 5.7 s s Δ C:: ? s Δ C, s - ss (s). β- s s s 20 / 96 (5). β- s - z s O A. s s β- s s / 374.1038 + $^{+}$(2 6). s s A- D- -B, β- s sss s s β- . s , s ss s s s β- . C

DOI: 10.1021/acssynbio.5b00138
ACS Synth. Biol. 2016, 5, 15−20

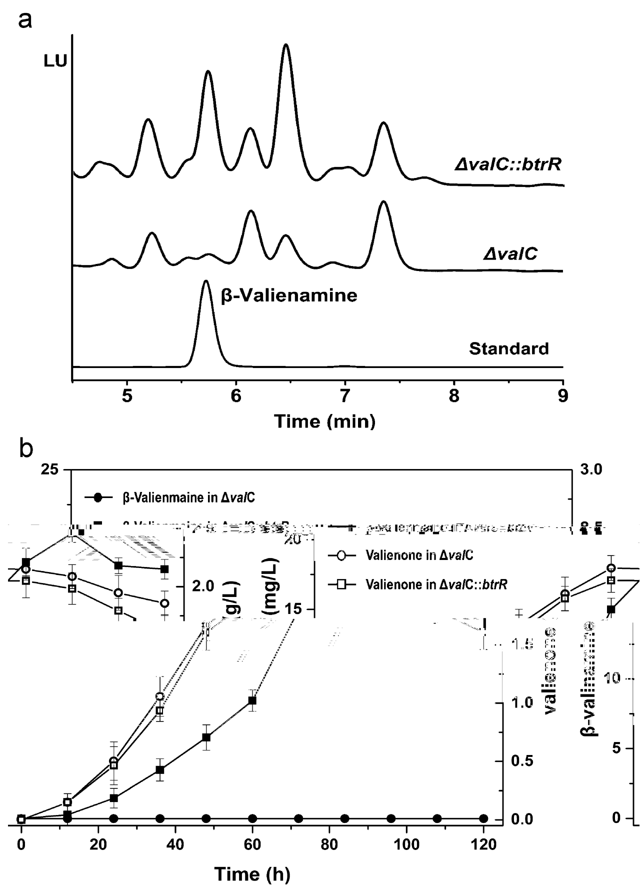

Figure 5. β- Δ C ( ) C 96- A. ( ) β- Δ C Δ C::

β- β- B β-

MATERIALS AND METHODS

Chemicals. A C (, C). β- B ( ). -A ( ).

Molecular Phylogenetic Analysis by Maximum Likelihood. C (D CD D) = ; = 10;

= 0.2. A6

Expression and Purification of SATs. C A 28 B 21 (D 3). B 100 μ / 37 °C 600 0.3−0.5 0.8 β-D- 10 s6- 20 (7.5), 20 A (7.5) D A

Enzymatic Activity and the Kinetic Parameter Assays. (A), 1 / A 5 5 20 (7.5) 0.3 5′- 37 °C 3

37 °C AD (D) 0.5 D 5 0.5 AD AD (ε_{340} = 6220 $^{-1}$ $^{-1}$) 340 (D). 1 μ AD

Stereopurity Determination of β-Valienamine by HPLC with Precolumn Derivatization Using OPA. β- A 1200 C β- ( )- 0.15 A 0.40 (9.0) DB-C18 (5 μ, 4.6 × 150) 22% 30 °C 18 445 340 β- 5.7 5.1

β-Valienamine Purification from the Reaction Mixture and the Fermentation Broth of ΔvalC::btrR. A -10 (>10 000) D 1 × 2 ( ) (0.5 × 15) β- Δ C:: D 50 × 8 ($^{+}$) 0.5 D 1 × 2 ($^{-}$)

High Resolution-Mass Spectrometry (HR-MS) and Nuclear Magnetic Resonance Spectrometry (NMR). A 1290- 6230 D_2O ^{1} ^{13}C

DOI: 10.1021/acssynbio.5b00138
ACS Synth. Biol. 2016, 5, 15−20

CO ... 400 ...

Construction of ΔvalC::btrR Mutant. ... 0.9 ... 1.3 ... (+) ... 927. ... 12567 (8002) ...

Fermentation of *S. hygroscopicus* 5008 and Its Mutants. ... 5008 ... 72–120 ... 37 °C ... 220 ... 100, ... 25, ... 5, ... 1, ... $_2$O$_4$ 1.5). ... 12 ... 12 000 ... 10 ...

Validamycin A Analysis by HPLC. ... 5008 ... DB-C18 (5 μ..., 4.6 × 150 ...) ... C$_3$C / $_2$O (3:97) ... 30 °C ... 18 ... 210 ...

Valienone Analysis by HPLC with DNPH Precolumn Derivatization. ... 2,4- ... 7.57 ... 5% $_3$ O$_4$ ... DB-C18 (5 μ..., 4.6 × 150 ...) ... 50% ... 30 °C ... 18 ... 380 ...

ASSOCIATED CONTENT

Supporting Information

... DOI: 10.1021/ ... .5 00138.

...

AUTHOR INFORMATION

Corresponding Authors

* +86-21-34207189. ... 2009@s ...

* +86-21-34206722. ... @s ...

Notes

...

ACKNOWLEDGMENTS

... (973 ... 2012CB721003), ... (31200061), ... (13 102090066). ...

REFERENCES

(1) ... (2003) ... 20, 137–166.

(2) ... (2007) ... 7, 679–691.

(3) ... (2009) ... 3, 7–19.

(4) ... (2013) ... 5, 1551–1558.

(5) ... (2013) ... 35, 515–523.

(6) ... (2010) ... β- ... β- ... 44, 48–54.

(7) ... (2012) ... 106, 92–98.

(8) ... (2003) ... 100, 15912–15917.

(9) ... (1980) ... 713–716.

(10) ... (1983) ... 48, 1203–1207.

(11) ... (1996) ... β-D- ... 6, 929–932.

(12) ... (1998) ... β- ... 6, 1955–1962.

(13) ... (2008) ... 343, 1675–1692.

(14) ... (2013) ... (+)- ... 368, 8–15.

(15) ... (2013) ... (+)- ... (−)-1- ... 69, 10384–10390.

(16) ... (2012) ... 1, 491–492.

(17) ... (2015) ... 1,2- ... 4, 378–382.

(18) ... (2013) ...

(19) ... (2010) ... 329, 305–309.

(20) ... (2005) ...

5008. *A* *71,* 5066−5076.

(21) B ss, D . (2006) s s s s A. C . *B* *13,* 387−397.

(22) , D , C , D. . (2011) s s s s . *B* 27, 2465−2467.

(23) , B. , C , B. s , B. (2005) s s s s *C* *B:* . *37,* 47−55.

(24) (2002) : 2- - - s s s s s s s *B* . *A* . *55,* 707−714.

(25) B . (2007) D s: s s s s s . *B* *46,* 8999−9006.

(26) C , . D., C , A. . (2008) A D - s s s D - s s s . *B* *47,* 10685−10693.

(27) B z , . D., , A. A., z, C. . (2003) A s s 4- -4- - s s s s A s s (A B) s D -4- - s . *B* *C* . *278,* 24731−24739.

(28) A s , A., . (1989) -s -s ss s s s s s s . *A* *B* . *182,* 129−135.

(29) , B , D . (2007) C, C_7-C s s s A. C *B* *C* *8,* 632−641.

(30) , C., , B , D . (2012) s s s s s 5008. *B* *C* *G* *13,* 337−350.

DOI: 10.1021/acssynbio.5b00138
ACS Synth. Biol. 2016, 5, 15−20