

Supplemental Material

Functional and phylogenetic divergence of fungal adenylate-forming reductases

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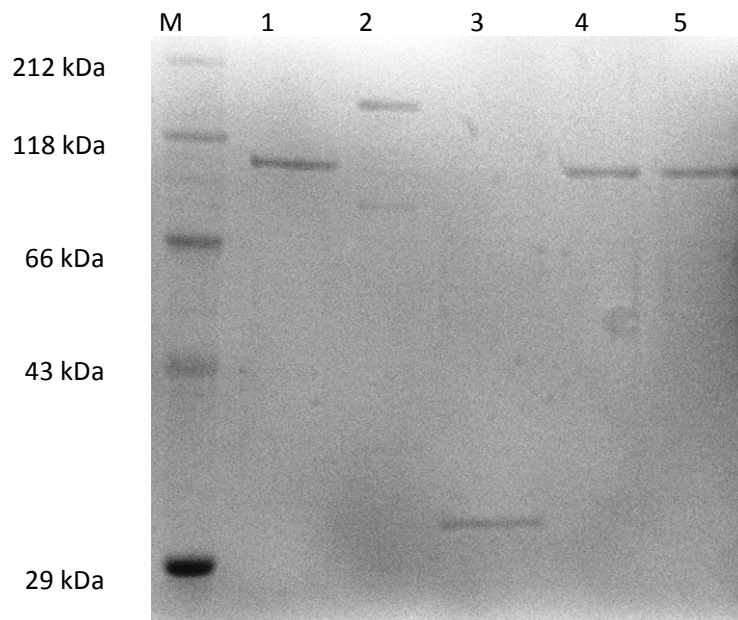


Figure S1. SDS-Polyacrylamide gel electrophoresis of purified enzymes Nps1 (lane 1), Nps3 (lane 2), phosphopantetheinyltransferase Svp (lane 3) LnaA (lane 4), and LnbA (lane 5). Left lane: molecular weight standard (M).

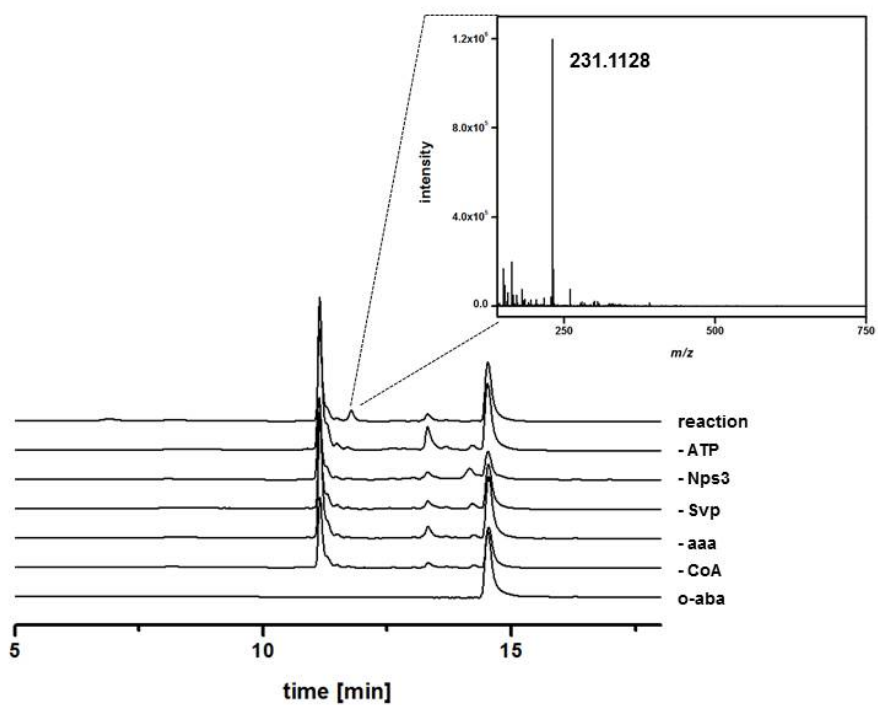


Figure S2. LC/MS-analysis of Nps3-catalyzed L- α -aminoadipate-6-semialdehyde formation. This product stands in chemical equilibrium with Δ^1 -piperidine-6-carboxylic acid. *O*-aminobenzaldehyde reacts with the latter to give the dihydroquinazolinium cation (m/z 231.1128 [M]⁺), which is not present in the controls without enzyme or substrates. The signal at $t_R = 11.3$ min is unknown.

Table S1. Sequences used for the phylogenetic analyses of fungal adenylate-forming reductases.

| Name | Accession | Organism | Length (aa) |
|----------------------------------|------------------|--|--------------------|
| <i>A. bisporus</i> XP_006462975 | XP_006462975 | <i>Agaricus bisporus</i> var. <i>bisporus</i> H97 | 1092 |
| <i>A. clavatus</i> XP_001275157 | XP_001275157 | <i>Aspergillus clavatus</i> NRRL 1 | 996 |
| <i>A. flavus</i> LnaA | XP_002384042.1 | <i>Aspergillus flavus</i> NRRL3357 | 1042 |
| <i>A. flavus</i> LnbA | XP_002384859.1 | <i>Aspergillus flavus</i> NRRL3357 | 1029 |
| <i>A. fumigatus</i> XP_001481395 | XP_001481395 | <i>Aspergillus fumigatus</i> Af293 | 994 |
| <i>A. nidulans</i> XP_664048 | XP_664048 | <i>Aspergillus nidulans</i> FGSC A4 | 1039 |
| <i>A. terreus</i> ATEG_03630 | XP_001212808 | <i>Aspergillus terreus</i> NIH2624 | 1069 |
| <i>Brevibacillus brevis</i> PheA | 1AMU | <i>Brevibacillus brevis</i> | 548 |
| <i>C. albicans</i> Lys2 | Q12572 | <i>Candida albicans</i> | 1391 |
| <i>C. cinerea</i> NPS3 | XP_001836648.2 | <i>Coprinopsis cinerea</i> okayama | 1049 |
| <i>C. subvermispota</i> NPS1 | EMD40260.1 | <i>Ceriporiopsis subvermispota</i> B | 1049 |
| <i>C. subvermispota</i> NPS3 | EMD34789.1 | <i>Ceriporiopsis subvermispota</i> B | 1417 |
| <i>D. squalens</i> Lys2 | EJF63849.1 | <i>Dichomitus squalens</i> LYAD-421 SS1 | 1428 |
| <i>D. squalens</i> NPS1 | EJF63449.1 | <i>Dichomitus squalens</i> LYAD-421 SS1 | 1033 |
| <i>F. mediterranea</i> NPS1 | EJC98159.1 | <i>Fomitiporia mediterranea</i> MF3/22 | 1045 |
| <i>F. oxysporum</i> EXM16769 | EXM16769 | <i>Fusarium oxysporum</i> f. sp. <i>vasinfectum</i> 25433 | 992 |
| <i>F. pinicola</i> Lys2 | EPS97414 | <i>Fomitopsis pinicola</i> FP-58527 SS1 | 1211 |
| <i>G. trabeum</i> EPQ54396 | EPQ54396 | <i>Gloeophyllum trabeum</i> ATCC 11539 | 1059 |
| <i>H. annosum</i> Lys2 | ETW75842 | <i>Heterobasidion irregulare</i> TC 32-1 | 1419 |
| <i>M. roreri</i> ESK96610 | ESK96610 | <i>Moniliophthora roreri</i> MCA 2997 | 1086 |

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|-------------------------------|-------------------|--|------|
| <i>M. roleri</i> ESK96610 | ESK96610 | <i>Moniliophthora roleri</i> MCA 2997 | 1086 |
| <i>P. brevispora</i> Lys2 | ProteinID 161728 | <i>Phlebia brevispora</i> HHB-7030 SS6 | 1428 |
| <i>P. brevispora</i> NPS1 | ProteinID 137634 | <i>Phlebia brevispora</i> HHB-7030 SS6 | 1022 |
| <i>P. carnosa</i> NPSX | EKM49537.1 | <i>Phanerochaete carnosa</i> HHB-10118-sp | 1024 |
| <i>P. ostreatus</i> NPS1 | ProteinID 1062196 | <i>Pleurotus ostreatus</i> PC15 | 915 |
| <i>P. strigosozonata</i> NPS2 | EIN08908 | <i>Punctularia strigosozonata</i> HHB-11173 SS5 | 1443 |
| <i>S. cerevisiae</i> Lys2 | NP_009673.1 | <i>Saccharomyces cerevisiae</i> S288c | 1392 |
| <i>S. hirsutum</i> EIM84978 | EIM84978 | <i>Stereum hirsutum</i> FP-91666 SS1 | 1086 |
| <i>S. hirsutum</i> Lys2 | EIM82061.1 | <i>Stereum hirsutum</i> FP-91666 SS1 | 1425 |
| <i>S. hirsutum</i> NPS3 | EIM85977.1 | <i>Stereum hirsutum</i> FP-91666 SS1 | 1048 |
| <i>T. reesei</i> XP_006964071 | XP_006964071 | <i>Trichoderma reesei</i> QM6a | 1052 |
| <i>T. versicolor</i> NPS4 | EIW55513.1 | <i>Trametes versicolor</i> FP-101664 SS1 | 1419 |
| <i>T. versicolor</i> NPS7 | EIW59229.1 | <i>Trametes versicolor</i> FP-101664 SS1 | 1035 |
| <i>T. virens</i> EHK20896 | EHK20896 | <i>Trichoderma virens</i> Gv29-8 | 969 |
| <i>T. virens</i> EHK23193 | EHK23193 | <i>Trichoderma virens</i> Gv29-8 | 1049 |