

Paths of analysis*

Analysis 3

Synthia

March 3, 2022

1 Analysis parameters

Analysis type: Automatic Retrosynthesis

Rules: none selected

Filters: FGI, FGI with protections

Max. paths returned: 5

Max. iterations: 300

Commercial:

1. Max. molecular weight - 1000 g/mol
2. Max. price - 1000 \$/g

Published:

1. Max. molecular weight - 1000 g/mol
2. Popularity - 10

My Stockroom:

1. Max. molecular weight - 1000 g/mol

Reaction scoring formula: $\text{TUNNEL_COEF} * \text{FGI_COEF} * \text{STEP} * 20 + 1000000 * (\text{CONFLICT} + \text{NON_SELECTIVITY} + \text{FILTERS} + \text{PROTECT})$

Chemical scoring formula: $\text{SMALLER}^3, \text{SMALLER}^{1.5}$

Min. search width: 400

Max. reactions per product: 60

Strategies: none selected

*The results stated herein were generated using the proprietary platform owned and maintained by Grzybowski Scientific Inventions, Inc., a subsidiary of Merck KGaA, Darmstadt Germany. The results are provided on an as is basis, and shall be used solely in connection with the rights afforded in the license agreement and for no other purpose.

FGI Coeff: 0

JSON Parameters: {}

2 Paths

1 path found. *Paths are sorted by score. Reactions are sorted in appearance order for each path.*

2.1 Path 1

Score: 88.44

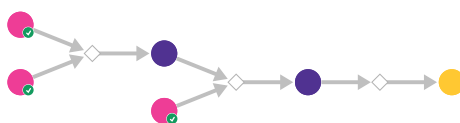
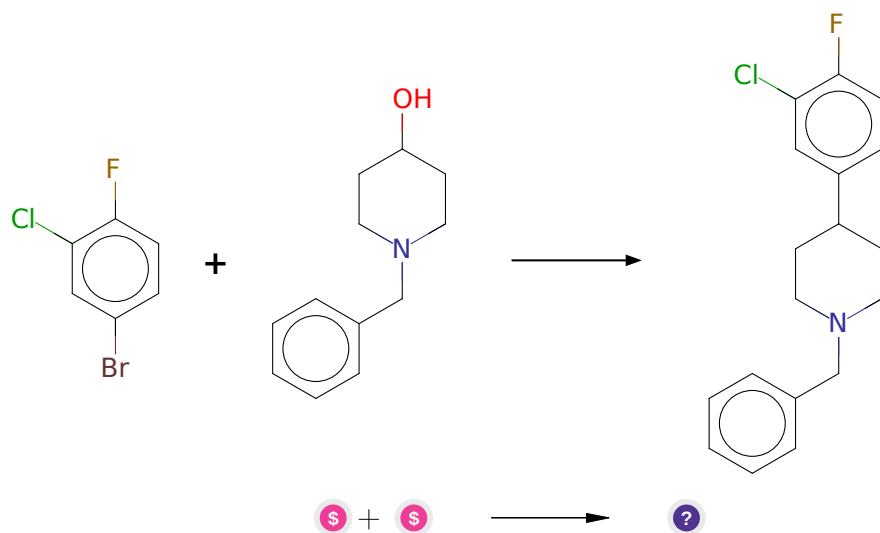


Figure 1: Outline of path 1

2.1.1 Double decarboxylative coupling or aryl halides with alcohols as latent nucleophiles



Substrates:

1. 4-Bromo-2-chloro-1-fluorobenzene - *available at Sigma-Aldrich*
2. 1-Benzyl-4-piperidinol - *available at Sigma-Aldrich*

Products:

1. Fc1ccc(C2CCN(Cc3ccccc3)CC2)cc1Cl

Typical conditions: 1.Oxalyl chloride 2.[Ir]-catalyst.[Ni]-catalyst.blue.light.dioxane.DMSO.DMF.CsHCO3.70 deg C

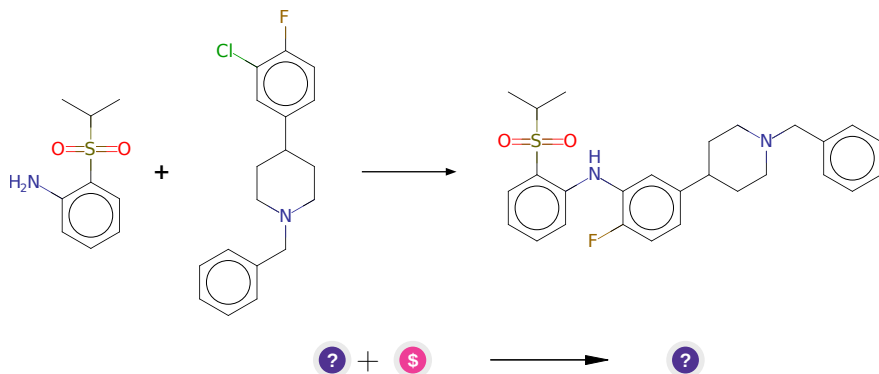
Protections: none

Yield: good

Reference: [10.1021/jacs.6b09533](#)

Retrosynthesis ID: 10032258

2.1.2 Amination of aryl chlorides



Substrates:

1. Fc1ccc(C2CCN(Cc3ccccc3)CC2)cc1Cl

2. 1-Amino-2-(isopropylsulphonyl)benzene - *available at Sigma-Aldrich*

Products:

1. CC(C)S(=O)(=O)c1ccccc1Nc1cc(C2CCN(Cc3ccccc3)CC2)ccc1F

Typical conditions: [Pd].Ligand.base

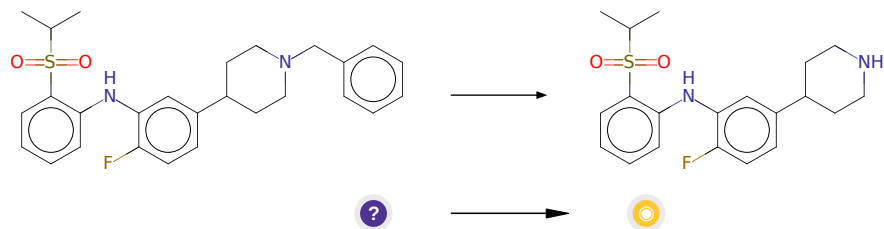
Protections: none

Yield: good

Reference: [10.1021/ja903049z](#) and [10.1021/jo060945k](#) and [10.1021/jo060190h](#) and [10.1021/ja8055358](#) and [10.1021/ja068926f](#) and [10.1002/anie.200601612](#) and [10.1021/acscatal.0c04280](#)

Retrosynthesis ID: 28545

2.1.3 Debenzylation



Substrates:

1. CC(C)S(=O)(=O)c1ccccc1Nc1cc(C2CCN(Cc3ccccc3)CC2)ccc1F

Products:

1. CC(C)S(=O)(=O)c1ccccc1Nc1cc(C2CCNCC2)ccc1F

Typical conditions: H₂. Pd/C or Pd(OH)₂

Protections: none

Yield: moderate

Reference: DOI: [10.1002/1521-3773\(20020603\)41:11<1895::AID-ANIE1895>3.0.CO;2-3](https://doi.org/10.1002/1521-3773(20020603)41:11<1895::AID-ANIE1895>3.0.CO;2-3) and [10.1021/jo400589j](https://doi.org/10.1021/jo400589j) and [10.1021/jm8012932](https://doi.org/10.1021/jm8012932) (SI,page S6) and [10.1080/00397911.2016.1261164](https://doi.org/10.1080/00397911.2016.1261164)

Retrosynthesis ID: 9995661