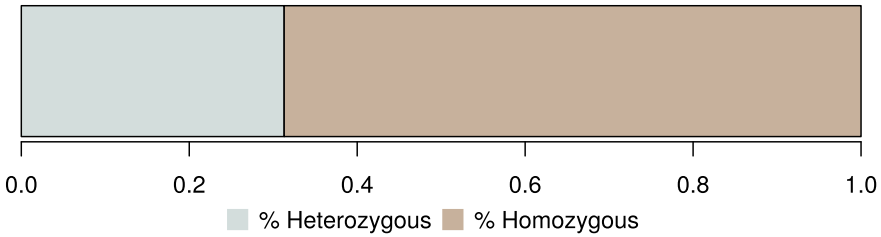
MARIGENE
EXPLORING CANNABIS GENETICS

Frank_STRAIN_NAME_Lenny_1

SGID	030-0004
Date	Mon Aug 20 14:22:45 MDT 2018
PlateUID	J.12
PipelineMD5	fdde89a8c2512a0d9828235412084fc6

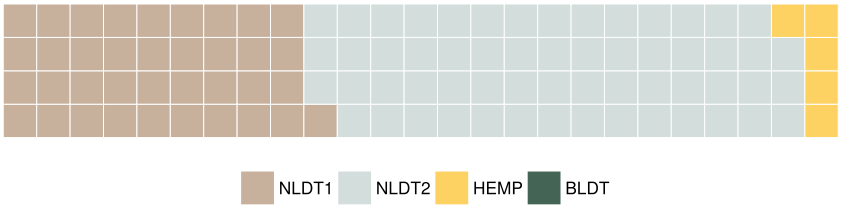
Stability

Greater genetic homozygosity leads to greater phenotypic stability which is the goal when breeding a consistently superior strain. Frank_STRAIN_NAME_Lenny_1 tested as 68.70 % homozygous (stable) and would be over 90% stable after 4 generations of sibling crosses.



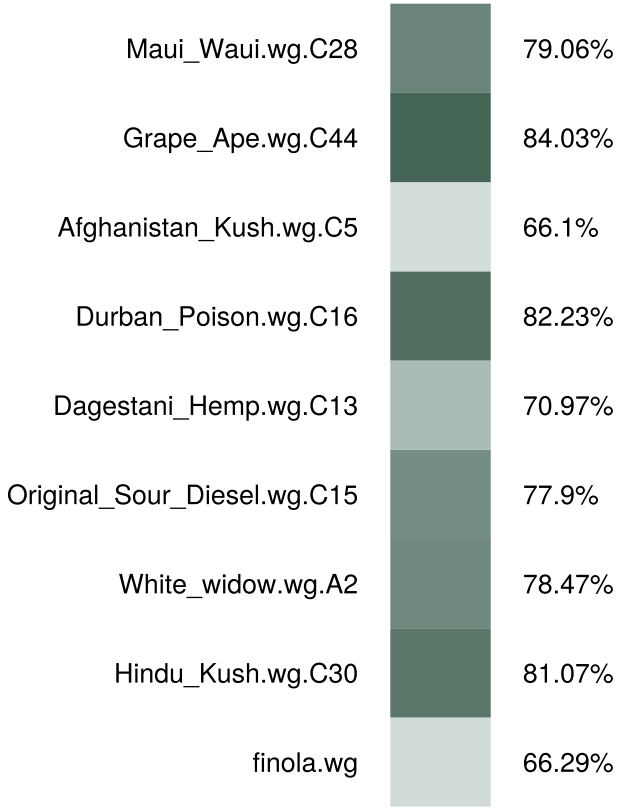
Ancestry

Ancestry is a description of how Frank_STRAIN_NAME_Lenny_1 partitions into the four major clades currently identified within *Cannabis*. The pedigree of Frank_STRAIN_NAME_Lenny_1 is 36.98 % NLDT1 (similar to the Durban Poisons and Haze), 57.81 % NLDT2 (Hawaiian types fall into this clade), 0.00 % BLDT (Afghan and/or Kush genetics), and 5.20 % Hemp (like Carmagnola and USO-31).



Similarity

The heat map represents how similar at the DNA level Frank_STRAIN_NAME_Lenny_1 is in relation to those in our reference database. The most similar strains (darker) are more recently related strains.



Evolution

The figure shows the closest relatives to Frank_STRAIN_NAME_Lenny_1 and it's most likely relation to fifteen popular and well-defined strains. Branch lengths are proportional to evolutionary distance.

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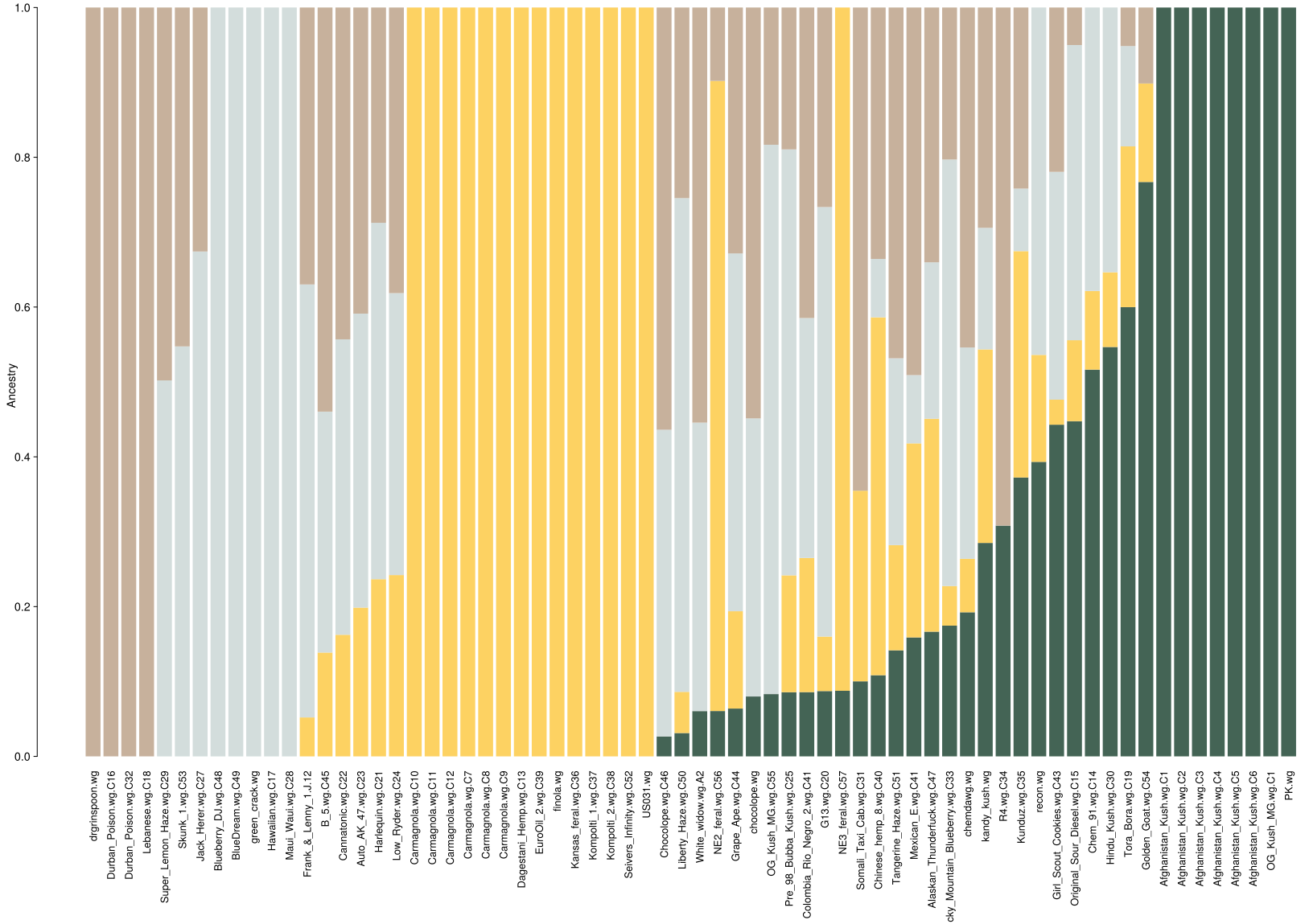
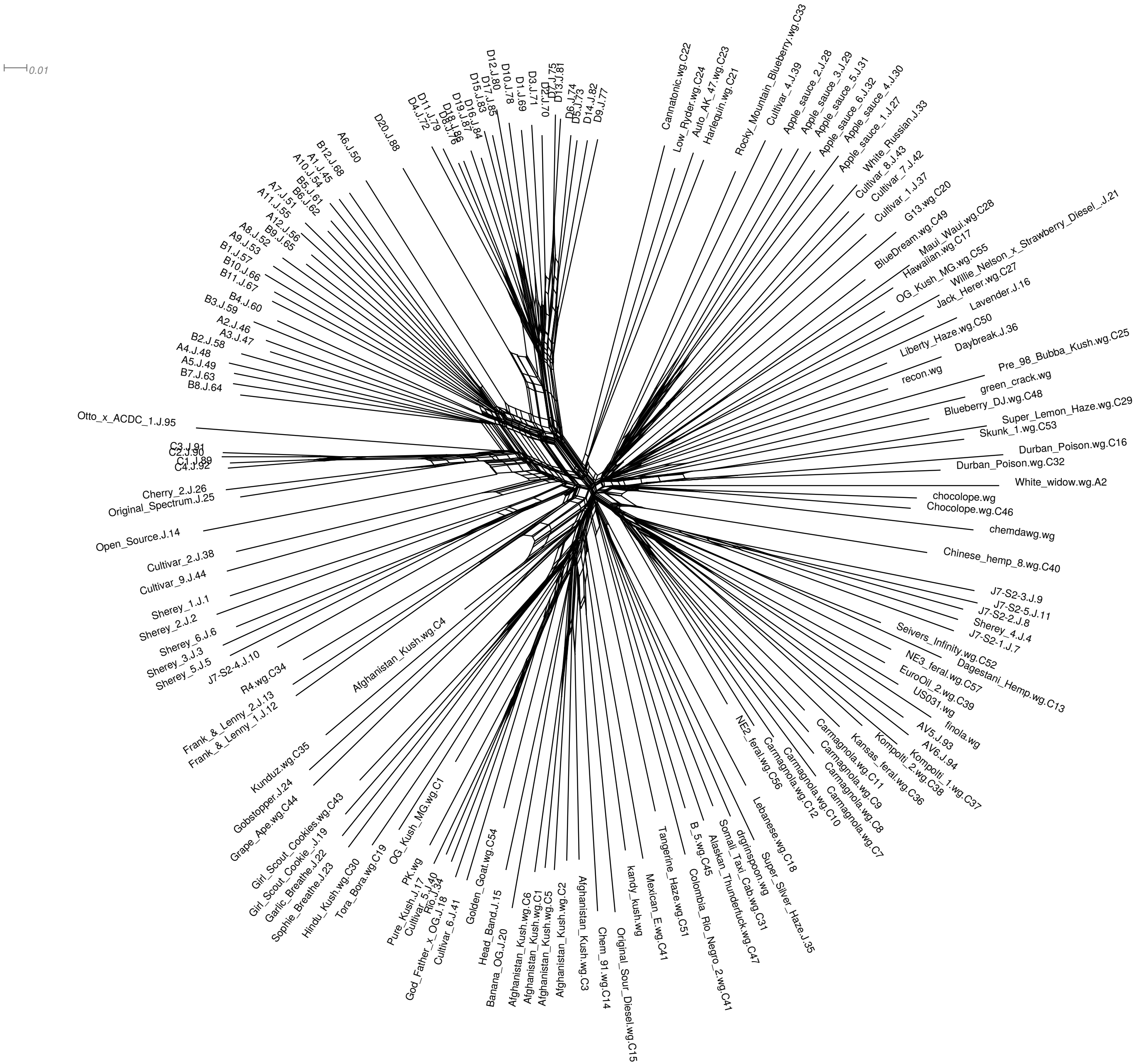
Population Structure

The population structure is similar to the ancestry analysis, but shows Frank_STRAIN_NAME_Lenny_1 in the broader context of our reference database. Bars of a single color indicate strains with the smallest degree of admixture.



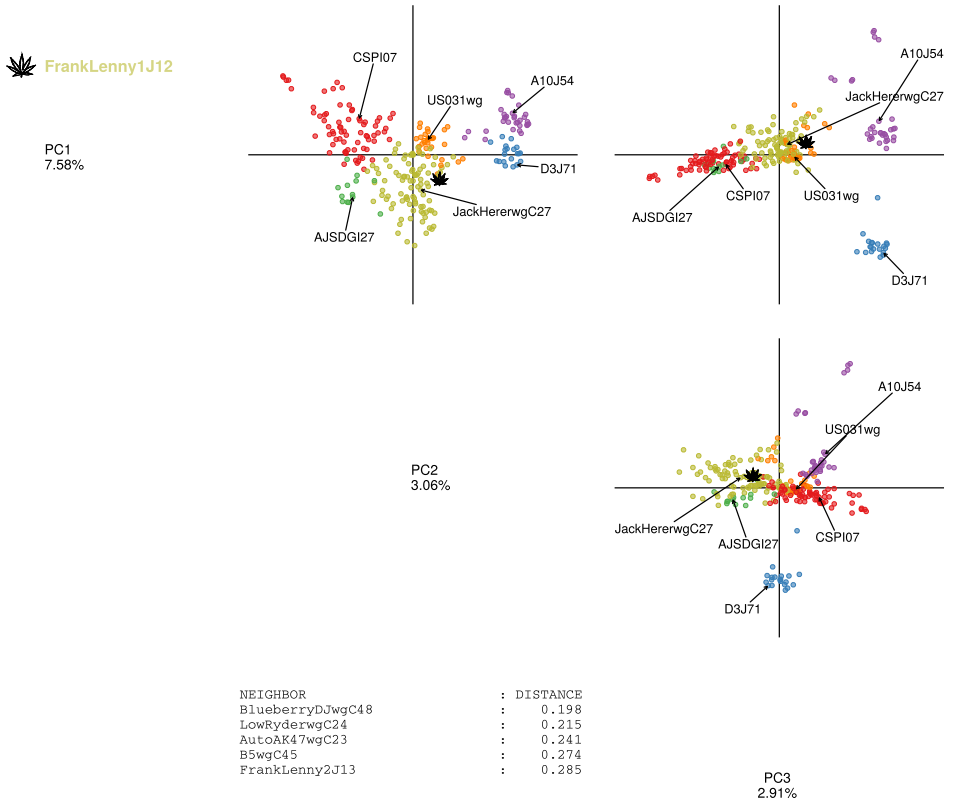
Star Chart

Cannabis is a diverse plant taxa with a complex breeding history. This star chart illustrates hybridization events leading to the modern strains. Evolutionary distance is measured outwards from the inside of the star. Connections between rays indicate the degree of hybridization between lines.


0.01
D20.J.88
D11.J.79
D4.J.72
D19.J.87
D8.J.76
D18.J.86
D16.J.84
D15.J.83
D17.J.85
D12.J.80
D10.J.78
D1.J.69
D3.J.71
D2.J.70
D7.J.75
D13.J.81
D6.J.74
D5.J.73
D14.J.82
D9.J.77
A6.J.50
B12.J.68
A1.J.45
A10.J.54
B5.J.61
B6.J.62
A7.J.51
A11.J.55
A12.J.56
A8.J.52
B9.J.65
A9.J.53
B1.J.57
B10.J.66
B11.J.67
B4.J.60
B3.J.59
A2.J.46
A3.J.47
B2.J.58
A4.J.48
A5.J.49
B7.J.63
B8.J.64
Otto_x_ACDC_1.J.95
C3.J.91
C2.J.90
C1.J.89
C4.J.92
Cherry_2.J.26
Original_Spectrum.J.25
Open_Source.J.14
Cultivar_2.J.38
Cultivar_9.J.44
Sherey_1.J.1
Sherey_2.J.2
Sherey_6.J.6
Sherey_3.J.3
Sherey_5.J.5
J7-S2-4.J.10
R4.wg.C34
Afghanistan_Kush.wg.C4
Frank_&_Lenny_2.J.13
Frank_&_Lenny_1.J.12
Kunduz.wg.C35
Gobstopper.J.24
Grape_Ape.wg.C44
Girl_Scout_Cookies.wg.C43
Girl_Scout_Cookie_J.19
Garlic_Breathe.J.22
Sophie_Breathe.J.23
Hindu_Kush.wg.C30
Tora_Bora.wg.C19
OG_Kush_MG.wg.C1
PK.wg
Pure_Kush.J.17
Cultivar_5.J.40
Rio.J.34
God_Father_x_OG.J.18
Cultivar_6.J.41
Golden_Goat.wg.C54
Head_Band.J.15
Banana_OG.J.20
Afghanistan_Kush.wg.C6
Afghanistan_Kush.wg.C1
Afghanistan_Kush.wg.C5
Afghanistan_Kush.wg.C2
Afghanistan_Kush.wg.C3
Chem_91.wg.C14
Original_Sour_Diesel.wg.C15
kandy_kush.wg
Mexican_E.wg.C41
Tangerine_Haze.wg.C51
B_5.wg.C45
Colombia_Rio_Negro_2.wg.C41
Alaskan_Thunderfuck.wg.C47
Somali_Taxi_Cab.wg.C31
dtginspoon.wg
Super_Silver_Haze.J.35
Lebanese.wg.C18
NE2_feral.wg.C56
Carmagnola.wg.C12
Carmagnola.wg.C10
Carmagnola.wg.C11
Carmagnola.wg.C9
Carmagnola.wg.C8
Carmagnola.wg.C7
Kansas_feral.wg.C36
Kompolti_2.wg.C38
Kompolti_1.wg.C37
AV5.J.93
AV6.J.94
finola.wg
US031.wg
EuroOil_2.wg.C39
NE3_feral.wg.C57
Dagestani_Hemp.wg.C13
Seivers_Infinity.wg.C52
J7-S2-1.J.7
Sherey_4.J.4
J7-S2-2.J.8
J7-S2-5.J.11
J7-S2-3.J.9
Chinese_hemp_8.wg.C40
chemdawg.wg
Chocolope.wg.C46
chocolope.wg
White_widow.wg.A2
Durban_Poison.wg.C32
Durban_Poison.wg.C16
Skunk_1.wg.C53
Super_Lemon_Haze.wg.C29
Blueberry_DJ.wg.C48
green_crack.wg
recon.wg
Pre_98_Bubba_Kush.wg.C25
Daybreak.J.36
Liberty_Haze.wg.C50
Lavender.J.16
Jack_Herer.wg.C27
OG_Kush_MG.wg.C55
Willie_Nelson_x_Strawberry_Diesel_.J.21
Hawaiian.wg.C17
Maui_Waui.wg.C28
BlueDream.wg.C49
G13.wg.C20
Cultivar_1.J.37
Cultivar_7.J.42
Cultivar_8.J.43
White_Russian.J.33
Apple_sauce_1.J.27
Apple_sauce_4.J.30
Apple_sauce_6.J.32
Apple_sauce_5.J.31
Apple_sauce_3.J.29
Apple_sauce_2.J.28
Cultivar_4.J.39
Rocky_Mountain_Blueberry.wg.C33
Harlequin.wg.C21
Auto_AK_47.wg.C23
Low_Ryder.wg.C24
Cannatonic.wg.C22

PCA & Clustering

We read thousands of genetic markers from Frank_STRAIN_NAME_Lenny_1 and compared them to hundreds of other plants. Next, we reduced this deluge of data down to the most informative principle components (PCs) - dimensions of variation. Three of the most important PCs are represented by one axis in the three below. The plants are partitioned into six groups based on how they cluster in this PC space. Each cluster is assigned a color and the arrows point to plant that is closest to each cluster's center. Frank_STRAIN_NAME_Lenny_1 is marked with a cannabis leaf in each figure and its five nearest neighbors are listed in the table at the bottom. Note that each figure displays two PCs. The upper two figures both have PC1 running horizontally and the two rightmost figures have PC3 running vertically. PC2 runs vertically through the top-left figure, horizontally through the bottom-right figure, and is absent from the figure in the corner. The percent of variation explained by each component is listed under its label.



NEIGHBOR	: DISTANCE
BlueberryDJwgC48	: 0.198
LowRyderwgC24	: 0.215
AutoAK47wgC23	: 0.241
B5wgC45	: 0.274
FrankLenny2J13	: 0.285