# Exclude and Restrict to UMLS Semantic Types

**Exclude Semantic Types**

If certain UMLS Semantic Types (SemTypes) are not useful for your research or produce undesirable results, MetaMap will ignore those SemTypes if called with the `--exclude_sts` or `-k` command-line option. E.g., to exclude Drug Delivery Devices, Medical Devices, and Research Devices, call MetaMap with

`-k drdd,medd,resd`

**Restrict to Semantic Types**

Conversely, if your research is focused exclusively on certain SemTypes, MetaMap will restrict its results to those SemTypes if called with the `--restrict_to_sts` or `-J` command-line option. E.g., to restrict results to concepts in the Disease or Syndrome and Injury or Poisoning SemTypes, call MetaMap with

`-J dsyn,inpo`

The names of the SemTypes called with `-k` and `-J` are all lowercase.

More information about UMLS Semantic Types is available here.

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Here are two examples of using `--exclude_sts` to reduce spurious ambiguity and/or limit false positives:

1. Ambiguous strings of SemType `Gene or Genome` (`gngm`): Many strings of the `gngm` SemType such as those below are ambiguous because they also denote UMLS concepts that are not primarily genetic. Excluding the `gngm` SemType may be useful to some researchers.

```
AIM      ARM      ART      BAR      CAMEL   CAR     CELL    CHAD   CLAMP   CLOCK    COIL
CRAMP    DREAM    DUET     FAN      FAT     FIAT    FIST    FLAP   FLOWER  GAS      GILT
GRASP    GRID     GRIT     HANG     HASH    HIP     HOP     HUB    HUGO    IMPACT   ITCH
JAM      JET      KID      KIR      LAMA    LAP     LARD    LIP    LOTUS   MAIL     MASK
MELT     MICA     MINERVA  MINT     MIST    MOLT    NAIL    NET    NODAL   NUMB     PAD
PALM     PARIS    PHI      PINCH    PION    PIP     PIT     POLE   PRUNE   PRY      RAGE
RAMP     SHARP    SHOT     SLUG     SOUL    SPA     SPICE   SPOT   STING   TACTILE  TAUT
TESMIN   TIP      TOPORS   TRAM     TRAP    TRUSS   TUB     TUNA   VERGE   WAVE     iCE
```

2. Strings of SemType `Finding` (`fndg`): We have found the `fndg` SemType to be especially noisy because many strings of that SemType, in particular numerical strings such as those below, are of dubious usefulness. Excluding the `fndg` SemType may be useful to some researchers.

```
0        0%       0.15    0.3     0.45    0.6     0.75    0.9     1
1 - 3    1+       1-10    1-2     1-24%   1.05    1.2     1.35    1.5
1.65     1.8      1.95    1/24    1/36    1/60    10%     10-14   11-12
11-16    13-14    15      15-19   15-21   16      17-24   19-26   2
2+       2.25     2.5     20%     20-24   20-25   29+     3       3 4
3 6      3+       3-4     3.5     3/12    3/18    3/24    3/36    3/4
3/6      3/60     3/9     30%     4       4+      4.5     400     4000
425      450      5       5 6     5-6     5-9     5.5     50%     500
550      575      6 9     6+11    6.5     6/12    6/18    6/24    6/3
6/30     6/36     6/4     6/45    6/5     6/6     6/60    6/9     60%
600      6000     65+     650     7-8     70%     75%)    80%     800
8000     850      9-10    9-18    90%     <50     +       ++      +++
```

Suppressing mostly numerical concepts such as those shown above can also be accomplished using this option of MetaMap2016V2.