Parkinson's Precision Medicine Initiative

All
n = 8,483

Inclusion

Able to provide informed consent

Exclusion

Contraindications to DaTSCAN™ or lumbar puncture

Current/recent use of dopamine modulators, stimulants or blood thinners

Diagnosis of atypical PD syndrome, dementia or significant neurological disorder

Medical/psychiatric condition or lab abnormality precluding safe participation

Excluded from our study:

- No or inconclusive αsyn-SAA result (4,833)
- No UPSIT result (n=1,370)
- Taking Original UPSIT (n=356)
- <50 years old at first UPSIT (n=49)
- Enrolled via monogenic risk pathway (n=27)

Enrolled as 'healthy control'
n = 80

≥30 years old	PD or iRBD diagnosis
	1st degree relative with PD

Enrolled as 'hyposmic'
n = 1,037

≥40 years old	PD or iRBD diagnosis
Revised UPSIT score <10th or <15th percentile*	

Isolated REM sleep behaviour disorder
n = 289

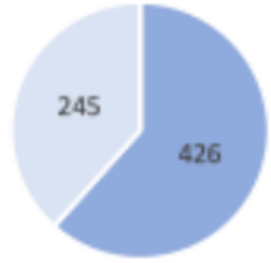
≥40 years old	PD diagnosis
Polysomnography-confirmed iRBD	

Parkinson's disease
n = 442

≥30 years old	Use of PD medication <90 days prior to baseline visit
PD diagnosed ≤2 years prior	
Hoehn and Yahr stage I or II	

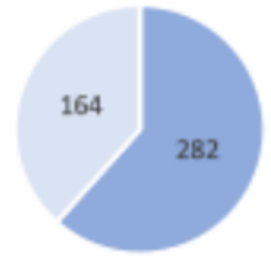
Hyposmia-enriched controls
n = 1,117

60%



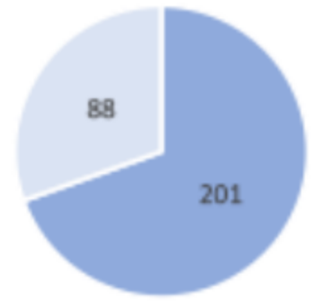
Discovery cohort

40%

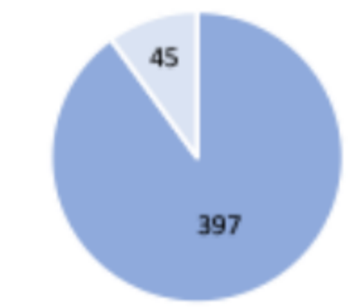


Validation cohort

■ αsyn-SAA +ve ■ αsyn-SAA -ve



■ αsyn-SAA +ve ■ αsyn-SAA -ve

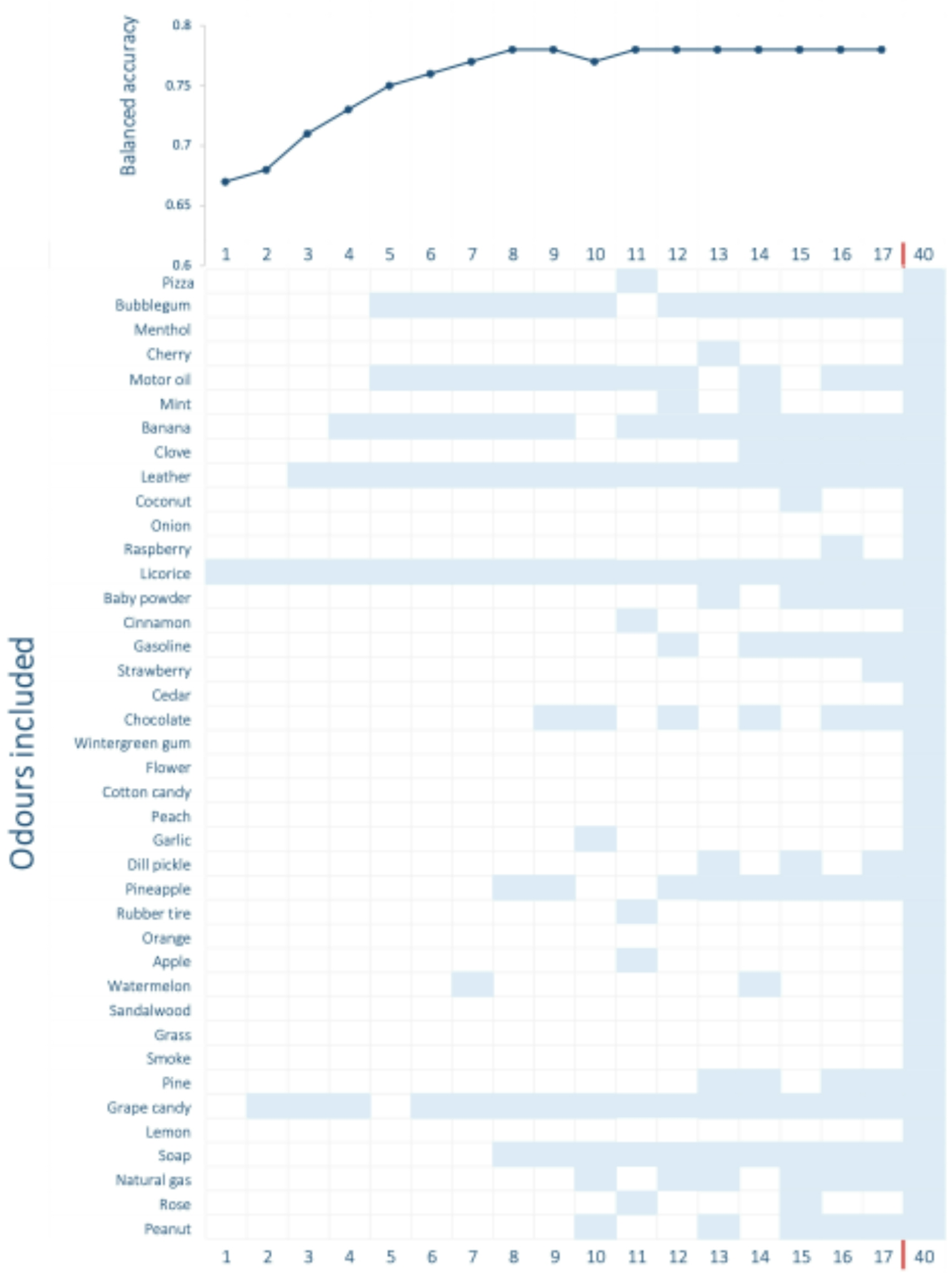


■ αsyn-SAA +ve ■ αsyn-SAA -ve

Figure 1: Overview of participant selection.

Flowchart showing inclusion/exclusion criteria for all participants (left) and subgroups (middle). The healthy control and hyposmic cohort were combined to create a novel 'hyposmia-enriched' control group, split into Discovery & Validation sets (60%/40%). Candidate tests were developed on a class-balanced Discovery subset (n = 219 / 219). High performing tests were then evaluated in iRBD and PD cohorts.

*Depending on protocol version. PPMI = Parkinson's Precision Medicine Initiative; DaTSCAN™ = Dopamine transporter scan; PD = Parkinson's disease; iRBD = Isolated REM sleep behaviour disorder; UPSIT = University of Pennsylvania Smell Identification Test; αsyn-SAA = α-synuclein seed amplification assay.


Balanced accuracy
0.8
0.75
0.7
0.65
0.6
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 40
Odours included
Pizza
Bubblegum
Menthol
Cherry
Motor oil
Mint
Banana
Clove
Leather
Coconut
Onion
Raspberry
Licorice
Baby powder
Cinnamon
Gasoline
Strawberry
Cedar
Chocolate
Wintergreen gum
Flower
Cotton candy
Peach
Garlic
Dill pickle
Pineapple
Rubber tire
Orange
Apple
Watermelon
Sandalwood
Grass
Smoke
Pine
Grape candy
Lemon
Soap
Natural gas
Rose
Peanut
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 40
Candidate UPSITs (no. items)