# Oracle Cloud Innovation Accelerator Program

## Using Cloud to Fight Nicotine Addiction

- Smoking is the second most common cause of death globally[1] (~5 million deaths annually) and remains a major public health issue

- ~86% of lung cancer caused by tobacco

- 25% of the world's population smokes[2]

- Most anti-smoking drugs are only moderately effective in reducing symptoms of withdrawal and may cause undesirable side-effects (nausea, headaches, etc.)

- Nicotine is the major psychoactive agent in tobacco, causing addiction and binds mainly to α4β2 nAChR[3] (nicotine receptor in the brain)



1. "The health consequence of smoking: nicotine addiction", CDC, **1988**
2. "World Cancer Report 2014", WHO, **2014**
3. Dineley et al (2015) Trends Pharmacol Sci 36:96-108

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- Researchers at Universities of Bath, Oxford-Brookes, Bristol and Milan are developing new molecules with improved effectiveness, specificity, and tolerability to be used as smoking cessation aids

- The team created a cluster of 5400 CPU cores in one hour and ran all the simulations successfully over 4 days, using ~600,000 CPU hours in total

- Running these simulations using Oracle's high performance cloud infrastructure saved the team over 3 months vs their traditional "on-premise" approach

**Individual Simulation Time to Completion / hours**

| | |
|---|---|
| On-premise (28 core Broadwell) | |
| Oracle Cloud (52 core Skylake) | |

0  2  4  6  8  10  12  14  16  18

**Time to complete all simulations / days**

| | |
|---|---|
| On-premise (10 nodes) | |
| Oracle Cloud (100 nodes) | |

0  20  40  60  80  100



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