

例題 5.1

- <https://sbml.org> の What is SBML?のページにアクセスして、モデル記述言語の意義について調べてみよう。モデルを書き換えること無く複数のソフトウェアで扱えるようになること、研究者の間でモデルを共有・公開できるようになることに加えて、どのような利点があると書かれているだろうか。
- <https://www.ebi.ac.uk/biomodels> にアクセスして、「Manually Curated」セクションにおける数理モデルの対象生物種の内訳を見てみよう。ヒトに次いでモデルが多い生物は何だろうか。生物種になにか傾向は見られるだろうか。

解答例

- What is SBML?のページの「SBML is for people too」というところに、太字で **many benefits** と書かれている部分がヒントになります。この中で、3番目に書かれている **benefit** について述べればよいでしょう。例えば「モデルの存続可能性を飛躍的に高める」といったことを書けばよいです。なお、原文は以下の通りです：

(3) ensuring the survival of models (and the intellectual effort put into them) beyond the lifetime of the software used to create them.

← → ↻ sbml.org/documents/what-is-sbml/   ゲスト



SBML is for people too

SBML enables research teams to use a single model description throughout a project's life cycle even when projects involve heterogeneous software tools. An ecosystem of SBML-compatible software tools today allows researchers to use SBML in all aspects of a modeling project, including creation (manual or automated), annotation, comparison, merging, parametrization, simulation/analysis, results comparison, network motif discovery, system identification, omics data integration, visualization, and more. Such use of a standardized format, along with standard annotation schemes and training in reproducible methods, improves research workflows and is generally recognized as promoting research reproducibility.

The adoption of SBML offers **many benefits**, including: (1) enabling the use of multiple tools without rewriting models for each tool, (2) enabling models to be shared and published in a form other researchers can use even in a different software environment, and (3) ensuring the survival of models (and the intellectual effort put into them) beyond the lifetime of the software used to create them.

- BioModels のトップページから辿れる **Manually Curated** のページに移動し、左側に見えている **Organisms** を眺めてみてください。圧倒的に多いのは *Homo sapiens* ですが、その次以降 *cellular organisms*, *Mus musculus*, *Mammalia*, ...のようになっていることがわかります。厳密な意味での生物種だと、マウス (*Mus musculus*) が2番目に多いようです。全体的な傾向としては、いわゆる「モデル生物」としてこれまでよく研究されてきた生物種が多いことがわかります。

The screenshot shows the BioModels website search results for manually curated models. The browser address bar shows the URL: `ebi.ac.uk/biomodels/search?query=%3A*+AND+curationstatus%3A%22Manually+curated%22&domain=biomodels`. The page features a navigation menu with links for Home, Browse, Submit, Curation, Help, About us, and Contact us. On the left side, there are filters for Model Flag (Non Miriam (2), Non Kinetic (1)) and Organisms (Find your Organisms: Homo sapiens (406), cellular organisms (77), Mus musculus (67), Mammalia (61)). The main content area displays a list of model entries, each with a title, ID, format, submitter, upload date, and publication date. The visible entries are:

- [Tyson2003 Perfect Adaption](#)
ID: BIOMD0000000726 | Format: SBML | Submitter: Sarubini Kananathan | Uploaded date: 28/08/2018 | Last modified date: 06/12/2018 | Published in: 2017
- [Figueredo2013/3 - immunointeraction full model](#)
ID: BIOMD0000000756 | Format: SBML | Submitter: Jinghao Men | Uploaded date: 22/07/2019 | Last modified: 22/07/2019 | Published in: 2013
- [Golomb2006 SomaticBursting](#)
ID: BIOMD0000000118 | Format: SBML | Submitter: Enuo He | Uploaded date: 20/06/2007 | Last modified: 05/07/2012 | Published in: 2006
- [Creemers2021 - Tumor-immune dynamics and implications on immunotherapy responses](#)