Classes, Styles, Conflicts
The Biological Realm of \LaTeX

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The class / styles conflicts nightmare

- **Classes**
  - \texttt{CurVe}, QCM

- **Styles**
  - FiXme, \texttt{FiNK}, QCM, DoX, LstBlocks (soon)

- **Documents!**
  - Paradoxical situation: “If it ain’t broke, then fix it”
The birth of a baby document
A miracle of nature

- When it doesn’t work, you don’t really know why
- When it does work, you *really* don’t know why
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Morphological Analogy
A unicellular eukaryote LaTeX document

Nuclear Envelope
Plasma Membrane

Nucleus
Cytoplasm

Plasma Membrane

\documentclass{article}
\begin{document}
\end{document}
Functional Analogy
Genetic vs. programmatic material

DNA → mRNA → Protein

\def\foo{F00}
\foo

Typesetting
Gene\TeX\ Material

- **Original genome** ↔ **document class**
- **Viruses** ↔ **styles**
  - Contribute some gene\TeX\ material
  - Need to infect a host
  - Relatively small compared to their host

\TeX\Live 2009:

- 2462 styles, 327 LoC (av.)
- \texttt{mamastyle}: texshade (14470 LoC)
- \texttt{mimistyle}: \texttt{xq} (24535 LoC)
Infection Methods

■ **Exogenic**
  ▶ Majority of viral infections
  ▶ `\usepackage` in a document

■ **Endogenic**
  ▶ 5 – 8% of our own genetic pool (retro-viruses)
  ▶ `\RequirePackage` in a class
  ▶ `\TeXLive` 2009: 95% classes have 4 (av.) endogenic infections

■ **Endosymbiosis**
  ▶ *e.g.* mitochondria ← former prokaryotes
  ▶ `\LaTeX` needs more! (DoX ⊄ Doc, key/value processing)

■ **Stylophages**
  ▶ Style / style infection via `\RequirePackage`
    • `\TeXLive` 2009: 45% styles infected by 2 (av.) styles
  ▶ *Virophage* (Raoult 2008): infects the Mimivirus
Infection Types

- **Prostyles**
  - Gene\TeX\ material incorporated into the host’s
  - Wide range of effects
  - *e.g.* ~$F_i NK$~ (\InputIfFileExists), Hyperref
  - \let\@ldfoo\foo\def\foo\{...\@ldfoo ...} \renewcommand etc.

- **Satellites**
  - Delta virus (HDV) over HBV
  - DoX, Graphicx etc.

- **Host-dependent**
  - Rely on the host instead of another virus
  - *e.g.* Beamer themes

- **Cheaters**
  - Competition instead of cooperation
  - *e.g.* Umbravirus steals coat protein from Luteovirus
  - LstBlocks (steals from Verbatim)
Handling viral infections

- Prevention
- Vaccines
- Anti-viral agents

Prevention in the \LaTeX{} biotope

- by documentation
- FiXme: officially supports standard classes and KOMA
- Hyperref’s README file

There are too many problems with varioref. Nobody has time to sort them out. Therefore this package is now unsupported.
Adaptive Immune Systems I

- Adaptive Immunity
  - Acquisition of defenses against a pathogen
  - Immunological memory: history of previously encountered infections
  - Active immunological memory: long-term
    - Naturally acquired: mumps, measles etc.
    - Artificially acquired: vaccines

- Adaptive immunity in the \textit{\LaTeX} biotope
  - Scenario
    1. Class C + style S $\rightarrow$ bug
    2. Bug report
    3. New version of class C or style S
Adaptive Immune Systems II

- **New version of C**
  - Acquired immunity
  - `\@ifpackageloaded`
  - `\TeXLive 2009`
    - 13% classes have an active immune system against 2 (av.) styles

- **New version of S**
  - *viral tropism*
  - `\@ifclassloaded`
  - FiXme: tropism of 8 classes
  - Note: no `\@ifpackageloaded` $\Rightarrow$ “isotropic style”
Antiviral Agents

- **In biology**
  - Molecules targeted towards specific infections
  - Organism not prepared in advance
  - No immunological memory

- **In \LaTeX** (anti-style agents)
  - Section 6 of the Hyperref manual!
    - `\makeatletter`
    - `\let\saved@bibitem@bibitem\makeatother`
    - `% % And then later:`
    - `\begin{verbatim}
      \begingroup
      \makeatletter
      \let\@bibitem\saved@bibitem
      \nobibliography{database}
      \endgroup
    ```
Curative Infections

\ifpackageloaded from styles
  \texlive 2009: 8\% styles
  Minitoc: aware of 30 other packages
  LstBlocks: curative style
\fi

Anti-viral viruses?
  Mice: natural protection against \textit{Friend}
  Gene \textit{Fv1}
  1992: endogenic retro-viral origin
Conclusion (?)

- Drawing bridges between unrelated domains
- *Behavioral* patterns (Cf. Design Patterns)
- Probably only scratched the surface
- Beyond \LaTeX: M4, Lisp . . .
  - Too much intercession $\rightarrow$ things are *out of control*
The first oncogenic style ever:
  ▶ Recently discovered in the ventilation system of the Sir Francis Drake Hotel
  ▶ First strain

\ProvidesPackage{oncogenic}[2010/06/28 v1.0 TUG Virus]
\expandafter\let\csname ver@oncogenic.sty\endcsname\relax
\RequirePackage{oncogenic}

▶ Second strain (after mutation)

\ProvidesPackage{oncogenic}[2010/06/29 v2.0 TUG Virus]
\def\@ifl@aded#1#2{\expandafter\@secondoftwo}
\RequirePackage{oncogenic}