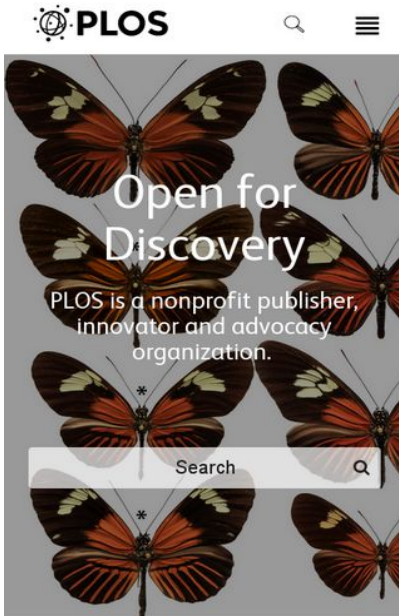


# PageSpeed Insights

Mobile



50 / 100 Speed

! Should Fix:

## Leverage browser caching

Setting an expiry date or a maximum age in the HTTP headers for static resources instructs the browser to load previously downloaded resources from local disk rather than over the network.

[Leverage browser caching](#) for the following cacheable resources:

- <https://plos.org/assets/jolene-0f3c33d117fc0968277c95446d229f55.css> (expiration not specified)
- <https://plos.org/assets/jolene-e378de7a68c37082db97bbfc4e31cfc4.js> (expiration not specified)
- <https://plos.org/assets/vendor-36a6ff20cb9bcfed07294be6f3ab24a.js> (expiration not specified)
- <https://plos.org/assets/vendor-40b5db5451764097a4963671e0c143d2.css> (expiration not specified)

## Mobile

- <https://plos.org/images/icon-burger.svg> (expiration not specified)
- <https://plos.org/images/icon-search.svg> (expiration not specified)
- <https://plos.org/images/logo-plos.svg> (expiration not specified)
- <https://plos.org/images/plos-logo-white.svg> (expiration not specified)
- [https://plos.org/lemur-commons/assets/fonts/fs\\_albert-bold-webfont.woff](https://plos.org/lemur-commons/assets/fonts/fs_albert-bold-webfont.woff) (expiration not specified)
- [https://plos.org/lemur-commons/assets/fonts/fs\\_albert-webfont.woff](https://plos.org/lemur-commons/assets/fonts/fs_albert-webfont.woff) (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pbio-9105fe077ea9ce978195b6f901664edd.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pcbi-2228d5cb1ea31230cbd956753dfd9d7c.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pgen-6547dc259e11f63165eb3f225a3fe0c6.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pmed-51302102e9df46f94f916d1c9969404a.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pntd-96163a970f759e4f3fe9d590c27ed4a2.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pone-76ab33f1fbe2ef0199f2acd168bf4fdf.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/ppat-cd05ff3919dc70e856952b4918901eba.jpg> (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_bio\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_bio_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_cb\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_cb_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_gen\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_gen_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_med\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_med_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_ntd\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_ntd_h.svg) (expiration not specified)

## Mobile

- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_one\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_one_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_path\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_path_h.svg) (expiration not specified)
- [https://plos.org/libre/landing\\_pages/home](https://plos.org/libre/landing_pages/home) (expiration not specified)
- [https://plos.org/uploads/image/file/27232/sm\\_Which\\_Journal.png](https://plos.org/uploads/image/file/27232/sm_Which_Journal.png) (expiration not specified)
- [https://plos.org/uploads/image/file/27233/sm\\_Why\\_Publish.png](https://plos.org/uploads/image/file/27233/sm_Why_Publish.png) (expiration not specified)
- [https://plos.org/uploads/image/file/27235/sm\\_Get-Involved.png](https://plos.org/uploads/image/file/27235/sm_Get-Involved.png) (expiration not specified)
- [https://plos.org/uploads/image/file/27332/sm\\_icon-test-tube.png](https://plos.org/uploads/image/file/27332/sm_icon-test-tube.png) (expiration not specified)
- [https://plos.org/uploads/image/file/30365/sm\\_PLOS-Collections.jpg](https://plos.org/uploads/image/file/30365/sm_PLOS-Collections.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/30366/sm\\_PLOS-Currents.jpg](https://plos.org/uploads/image/file/30366/sm_PLOS-Currents.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/30367/sm\\_PLOS-Blogs.jpg](https://plos.org/uploads/image/file/30367/sm_PLOS-Blogs.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/30368/sm\\_Research-News\\_home-page-image\\_\\_1\\_.jpg](https://plos.org/uploads/image/file/30368/sm_Research-News_home-page-image__1_.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/31441/blur\\_journal.pbio.1002353.g001.jpg](https://plos.org/uploads/image/file/31441/blur_journal.pbio.1002353.g001.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/31441/sm\\_journal.pbio.1002353.g001.jpg](https://plos.org/uploads/image/file/31441/sm_journal.pbio.1002353.g001.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32532/sm\\_iGem-donut2.png](https://plos.org/uploads/image/file/32532/sm_iGem-donut2.png) (expiration not specified)
- [https://plos.org/uploads/image/file/32648/sm\\_one.jpg](https://plos.org/uploads/image/file/32648/sm_one.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32649/sm\\_bio.jpg](https://plos.org/uploads/image/file/32649/sm_bio.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32650/sm\\_compbio.jpg](https://plos.org/uploads/image/file/32650/sm_compbio.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32651/sm\\_ntds.jpg](https://plos.org/uploads/image/file/32651/sm_ntds.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32652/sm\\_Home-page-SPOTLIGHT-10.31.16-BioRxiv.png](https://plos.org/uploads/image/file/32652/sm_Home-page-SPOTLIGHT-10.31.16-BioRxiv.png) (expiration not specified)
- [https://plos.org/uploads/image/file/32653/sm\\_Home-page-SPOTLIGHT-10.31.16.png](https://plos.org/uploads/image/file/32653/sm_Home-page-SPOTLIGHT-10.31.16.png) (expiration not specified)
- <https://www.googletagmanager.com/gtm.js?id=GTM-MQQMGF> (15 minutes)
- <https://www.googletagmanager.com/gtm.js?id=GTM-TP26BH> (15 minutes)
- <https://www.google-analytics.com/analytics.js> (2 hours)

### Eliminate render-blocking JavaScript and CSS in above-the-fold content

Your page has 2 blocking script resources and 2 blocking CSS resources. This causes a delay in rendering your page.

None of the above-the-fold content on your page could be rendered without waiting for the following resources to load. Try to defer or asynchronously load blocking resources, or inline the critical portions of those resources directly in the HTML.

#### [Remove render-blocking JavaScript:](#)

- <https://plos.org/assets/vendor-36a6ff20cb9bcfced07294be6f3ab24a.js>
- <https://plos.org/assets/jolene-e378de7a68c37082db97bbfc4e31cfc4.js>

#### [Optimize CSS Delivery](#) of the following:

- <https://plos.org/assets/vendor-40b5db5451764097a4963671e0c143d2.css>
- <https://plos.org/assets/jolene-0f3c33d117fc0968277c95446d229f55.css>



### Consider Fixing:

#### Enable compression

Compressing resources with gzip or deflate can reduce the number of bytes sent over the network.

[Enable compression](#) for the following resources to reduce their transfer size by 13.8KiB (79% reduction).

- Compressing [https://plos.org/libre/landing\\_pages/home](https://plos.org/libre/landing_pages/home) could save 13.8KiB (79% reduction).

#### Prioritize visible content

## Mobile

Your page requires additional network round trips to render the above-the-fold content. For best performance, reduce the amount of HTML needed to render above-the-fold content.

The entire HTML response was not sufficient to render the above-the-fold content. This usually indicates that additional resources, loaded after HTML parsing, were required to render above-the-fold content. [Prioritize visible content](#) that is needed for rendering above-the-fold by including it directly in the HTML response.

- None of the final above-the-fold content could be rendered even with the full HTML response.



### 6 Passed Rules

#### Avoid landing page redirects

Your page has no redirects. Learn more about [avoiding landing page redirects](#).

#### Reduce server response time

Your server responded quickly. Learn more about [server response time optimization](#).

#### Minify CSS

Your CSS is minified. Learn more about [minifying CSS](#).

#### Minify HTML

Your HTML is minified. Learn more about [minifying HTML](#).

#### Minify JavaScript

Your JavaScript content is minified. Learn more about [minifying JavaScript](#).

### Optimize images

Your images are optimized. Learn more about [optimizing images](#).

## 99 / 100 User Experience

### Consider Fixing:

#### Size tap targets appropriately

Some of the links/buttons on your webpage may be too small for a user to easily tap on a touchscreen. Consider [making these tap targets larger](#) to provide a better user experience.

The following tap targets are close to other nearby tap targets and may need additional spacing around them.

- The tap target `<a href="/faq">FAQ</a>` and 7 others are close to other tap targets.

### 4 Passed Rules

#### Avoid plugins

Your page does not appear to use plugins, which would prevent content from being usable on many platforms. Learn more about the importance of [avoiding plugins](#).

#### Configure the viewport

Your page specifies a viewport matching the device's size, which allows it to render properly on all devices. Learn more about [configuring viewports](#).

# Mobile

## Size content to viewport

The contents of your page fit within the viewport. Learn more about [sizing content to the viewport](#).

## Use legible font sizes

The text on your page is legible. Learn more about [using legible font sizes](#).

# Desktop



65 / 100 Speed

! Should Fix:

## Leverage browser caching

Setting an expiry date or a maximum age in the HTTP headers for static resources instructs the browser to load previously downloaded resources from local disk rather than over the network.

[Leverage browser caching](#) for the following cacheable resources:

- <https://plos.org/assets/jolene-0f3c33d117fc0968277c95446d229f55.css> (expiration not specified)
- <https://plos.org/assets/jolene-e378de7a68c37082db97bbfc4e31cfc4.js> (expiration not specified)

## Desktop

- <https://plos.org/assets/vendor-36a6ff20cb9bcfed07294be6f3ab24a.js> (expiration not specified)
- <https://plos.org/assets/vendor-40b5db5451764097a4963671e0c143d2.css> (expiration not specified)
- <https://plos.org/images/icon-search.svg> (expiration not specified)
- <https://plos.org/images/logo-plos.svg> (expiration not specified)
- <https://plos.org/images/plos-logo-white.svg> (expiration not specified)
- [https://plos.org/lemur-commons/assets/fonts/fs\\_albert-bold-webfont.woff](https://plos.org/lemur-commons/assets/fonts/fs_albert-bold-webfont.woff) (expiration not specified)
- [https://plos.org/lemur-commons/assets/fonts/fs\\_albert-webfont.woff](https://plos.org/lemur-commons/assets/fonts/fs_albert-webfont.woff) (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pbio-9105fe077ea9ce978195b6f901664edd.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pcbi-2228d5cb1ea31230cbd956753dfd9d7c.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pgen-6547dc259e11f63165eb3f225a3fe0c6.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pmed-51302102e9df46f94f916d1c9969404a.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pntd-96163a970f759e4f3fe9d590c27ed4a2.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/pone-76ab33f1fbe2ef0199f2acd168bf4fdf.jpg> (expiration not specified)
- <https://plos.org/lemur-commons/assets/images/journals/bg/ppat-cd05ff3919dc70e856952b4918901eba.jpg> (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_bio\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_bio_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_cb\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_cb_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_gen\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_gen_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_med\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_med_h.svg) (expiration not specified)



## Desktop

- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_ntd\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_ntd_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_one\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_one_h.svg) (expiration not specified)
- [https://plos.org/lemur-commons/assets/images/journals/logos/PLOS\\_path\\_h.svg](https://plos.org/lemur-commons/assets/images/journals/logos/PLOS_path_h.svg) (expiration not specified)
- [https://plos.org/libre/landing\\_pages/home](https://plos.org/libre/landing_pages/home) (expiration not specified)
- [https://plos.org/uploads/image/file/27232/sm\\_Which\\_Journal.png](https://plos.org/uploads/image/file/27232/sm_Which_Journal.png) (expiration not specified)
- [https://plos.org/uploads/image/file/27233/sm\\_Why\\_Publish.png](https://plos.org/uploads/image/file/27233/sm_Why_Publish.png) (expiration not specified)
- [https://plos.org/uploads/image/file/27235/sm\\_Get-Involved.png](https://plos.org/uploads/image/file/27235/sm_Get-Involved.png) (expiration not specified)
- [https://plos.org/uploads/image/file/27332/sm\\_icon-test-tube.png](https://plos.org/uploads/image/file/27332/sm_icon-test-tube.png) (expiration not specified)
- [https://plos.org/uploads/image/file/30365/sm\\_PLOS-Collections.jpg](https://plos.org/uploads/image/file/30365/sm_PLOS-Collections.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/30366/sm\\_PLOS-Currents.jpg](https://plos.org/uploads/image/file/30366/sm_PLOS-Currents.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/30367/sm\\_PLOS-Blogs.jpg](https://plos.org/uploads/image/file/30367/sm_PLOS-Blogs.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/30368/sm\\_Research-News\\_home-page-image\\_\\_1\\_.jpg](https://plos.org/uploads/image/file/30368/sm_Research-News_home-page-image__1_.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/31441/blur\\_journal.pbio.1002353.g001.jpg](https://plos.org/uploads/image/file/31441/blur_journal.pbio.1002353.g001.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/31441/sm\\_journal.pbio.1002353.g001.jpg](https://plos.org/uploads/image/file/31441/sm_journal.pbio.1002353.g001.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32532/sm\\_iGem-donut2.png](https://plos.org/uploads/image/file/32532/sm_iGem-donut2.png) (expiration not specified)
- [https://plos.org/uploads/image/file/32648/sm\\_one.jpg](https://plos.org/uploads/image/file/32648/sm_one.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32649/sm\\_bio.jpg](https://plos.org/uploads/image/file/32649/sm_bio.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32650/sm\\_compbio.jpg](https://plos.org/uploads/image/file/32650/sm_compbio.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32651/sm\\_ntds.jpg](https://plos.org/uploads/image/file/32651/sm_ntds.jpg) (expiration not specified)
- [https://plos.org/uploads/image/file/32652/sm\\_Home-page-SPOTLIGHT-10.31.16-BioRxiv.png](https://plos.org/uploads/image/file/32652/sm_Home-page-SPOTLIGHT-10.31.16-BioRxiv.png) (expiration not specified)
- [https://plos.org/uploads/image/file/32653/sm\\_Home-page-SPOTLIGHT-10.31.16.png](https://plos.org/uploads/image/file/32653/sm_Home-page-SPOTLIGHT-10.31.16.png) (expiration not specified)
- <https://www.googletagmanager.com/gtm.js?id=GTM-MQQMGF> (15 minutes)
- <https://www.googletagmanager.com/gtm.js?id=GTM-TP26BH> (15 minutes)
- <https://www.google-analytics.com/analytics.js> (2 hours)

## Eliminate render-blocking JavaScript and CSS in above-the-fold content

Your page has 2 blocking script resources and 2 blocking CSS resources. This causes a delay in rendering your page.

None of the above-the-fold content on your page could be rendered without waiting for the following resources to load. Try to defer or asynchronously load blocking resources, or inline the critical portions of those resources directly in the HTML.

### [Remove render-blocking JavaScript:](#)

- <https://plos.org/assets/vendor-36a6ff20cb9bcfed07294be6f3ab24a.js>
- <https://plos.org/assets/jolene-e378de7a68c37082db97bbfc4e31cfc4.js>

### [Optimize CSS Delivery](#) of the following:

- <https://plos.org/assets/vendor-40b5db5451764097a4963671e0c143d2.css>
- <https://plos.org/assets/jolene-0f3c33d117fc0968277c95446d229f55.css>

## Optimize images

Properly formatting and compressing images can save many bytes of data.

[Optimize the following images](#) to reduce their size by 127KiB (76% reduction).

- Compressing and resizing [https://plos.org/uploads/image/file/32651/sm\\_ntds.jpg](https://plos.org/uploads/image/file/32651/sm_ntds.jpg) could save 59.5KiB (76% reduction).
- Compressing and resizing [https://plos.org/uploads/image/file/32650/sm\\_compbio.jpg](https://plos.org/uploads/image/file/32650/sm_compbio.jpg) could save 37.8KiB (77% reduction).
- Compressing and resizing [https://plos.org/uploads/image/file/32649/sm\\_bio.jpg](https://plos.org/uploads/image/file/32649/sm_bio.jpg) could save 29.6KiB (73% reduction).

## Consider Fixing:

### Enable compression

Compressing resources with gzip or deflate can reduce the number of bytes sent over the network.

[Enable compression](#) for the following resources to reduce their transfer size by 13.8KiB (79% reduction).

- Compressing [https://plos.org/libre/landing\\_pages/home](https://plos.org/libre/landing_pages/home) could save 13.8KiB (79% reduction).

### Prioritize visible content

Your page requires additional network round trips to render the above-the-fold content. For best performance, reduce the amount of HTML needed to render above-the-fold content.

The entire HTML response was not sufficient to render the above-the-fold content. This usually indicates that additional resources, loaded after HTML parsing, were required to render above-the-fold content. [Prioritize visible content](#) that is needed for rendering above-the-fold by including it directly in the HTML response.

- None of the final above-the-fold content could be rendered even with the full HTML response.

## 5 Passed Rules

### Avoid landing page redirects

Your page has no redirects. Learn more about [avoiding landing page redirects](#).

# Desktop

## Reduce server response time

Your server responded quickly. Learn more about [server response time optimization](#).

## Minify CSS

Your CSS is minified. Learn more about [minifying CSS](#).

## Minify HTML

Your HTML is minified. Learn more about [minifying HTML](#).

## Minify JavaScript

Your JavaScript content is minified. Learn more about [minifying JavaScript](#).