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Subject: American Society for Microbiology Journals High-Level Accessibility Evaluation  
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MSU Usability/Accessibility Research and Consulting (MSU UARC) conducted a high-level accessibility evaluation of the American Society for Microbiology (ASM) Journals website to evaluate its conformance with WCAG 2.0 AA Criteria. This evaluation did not include all functionality or content of the site or all WCAG 2.0 AA Success Criteria.

During this evaluation, a number of issues were found that will make the site and its content impossible to use for many individuals with disabilities, and difficult to use for many others.

Critically, no obvious means to pause, stop, or hide the rotator on the Home pages is provided. Rotators that cannot be stopped create significant issues for individuals with cognitive and visual impairments, as well as for screen reader users. Issues of this type can interfere with the ability to use any part of a page for some users.

Keyboard users, including screen reader users and users with dexterity impairments, will have difficulty or be unable to use significant site content. Most importantly, interacting with some content breaks keyboard functionality. Most interactive elements lack a sufficiently visible focus indicator, making it difficult or impossible for many keyboard-only users to effectively use them, as they cannot determine when they have reached the correct element. Focus order is also incorrect in many places, further increasing the difficulty of using the site with a keyboard.

Individuals with visual impairments, including those that rely on screen readers, will have additional problems. Some content is read out incorrectly, and structural information (including heading and list structure) is not appropriately conveyed to users, making it difficult to understand content organization. Some form inputs are not appropriately labeled and form instructions are not associated with inputs, making those inputs difficult or impossible to use for those that rely on screen readers. Custom elements do not correctly announce themselves or provide appropriate feedback to screen readers, making them difficult or impossible to understand and use. Many images lack appropriate alternative text, significantly impacting users with visual impairments, and images of text are used in place of styled text, impacting users with visual impairments and users with reading and cognitive impairments.

While text in the PDF is provided to screen readers, the PDF has not been tagged for accessibility and no structural information is provided to assistive technologies, making it extremely difficult to use and navigate for users with disabilities. Additionally, images in the PDF lack alternative text and the PDF's title and language are not provided to assistive technologies.

Other issues were found that will make it difficult for users with a variety of disabilities to effectively use the system, including insufficient color contrast, insufficient link context, changes occurring on keyboard focus, and inappropriate page titles.

To improve access for users with disabilities, UARC recommends a full WCAG 2.0 AA evaluation and that the problems discovered be remediated.

*Note: "Results/page" and "Order by" filters on the Search Results page were not functional during the evaluation, and could not be evaluated.*

*Note: For the purposes of this high-level review, search results for "immunology" were used as an example of a Search Results page, "Clinical and Vaccine Immunology" volume 24, issue 12 (December 2017) was used as an example of an Issue, and "Randomized, Placebo-Controlled, Double-Blind Phase 2 Trial Comparing the Reactogenicity and Immunogenicity of a Single Standard Dose to Those of a High Dose of CVD 103-HgR Live Attenuated Oral Cholera Vaccine, with Shanchol Inactivated Oral Vaccine as an Open-Label Immunologic Comparator" was used as an example of a Publication page and PDF document.*

## High-Level Findings

### Conformance

- No obvious means is provided to pause, stop, or hide rotating content on Home page. [[WCAG 2.0 CR 5](#), [WCAG 2.0 SC 2.2.2](#)]

### Document Structure

- PDF is untagged, and provides no structural information to assistive technologies. [[WCAG 2.0 SC 1.3.1](#)]
- Headings are not correctly used to organize content. [[WCAG 2.0 SC 1.3.1](#)]
  - On the Home page, h2s are present with no preceding/grouping h1
  - On the Search Results page, "Refine Search" should be an h2, not an h5, and "Publication Date" and "Journal" should be h3s, not h2s
  - On the Issue page, "In This Issue" should be an h2, not an h3
  - On the Article page, "Participants", "Vaccine safety", etc. should be tagged as headings (h3s)
  - On the Article page, "Table 1", "Figure 2", etc. should be tagged as headings
  - On the Article page, "Related Articles" should be tagged as a heading (h2)
  - On the Article page, "We recommend" should be an h2, not an h3
  - On the Article page, the primary heading in each lightbox should be tagged as a heading (h1)
- Lists are not correctly used to organize content. [[WCAG 2.0 SC 1.3.1](#)]
  - On the Search Results page, "Show More"/"Show Less" links and "Next" link shouldn't be coded into one-item lists
  - On the Article page, lists under "Footnotes" and "We recommend" are not properly structured
- On the Home page, rotator content is read out multiple times. [[WCAG 2.0 SC 1.3.2](#)]
- In the Info & Metrics tab on the Article page, graph axis labels are incorrectly read out by screen readers. [[WCAG 2.0 SC 1.3.2](#)]
- The language of the PDF is not defined. [[WCAG 2.0 SC 3.1.1](#)]

### Keyboard Support

- In Firefox, if any link is clicked with a mouse or opened via keyboard (e.g., menu dropdowns, expanders, etc.), it cannot be moved past via keyboard subsequently (focus stops at the element and cannot be advanced further, or goes backwards to the prior element if focus is moved backwards to reach the element). In Internet Explorer, if any link is clicked with a mouse (e.g., menu dropdowns, expanders, etc.),

focus immediately resets to the start of the page upon reaching the element via keyboard subsequently. In Chrome (with a screen reader enabled), if any link is clicked with a mouse or opened via keyboard (e.g., menu dropdowns, expanders, etc.), it cannot receive keyboard focus again (focus skips the link and moves to the next element). [[WCAG 2.0 SC 2.1.1](#)]

- On the Article page, author name links, "Check for updates" button, and "TREND MD" settings button cannot be reached via keyboard. [[WCAG 2.0 SC 2.1.1](#)]
- Invisible elements receives focus before ads. [[WCAG 2.0 SC 2.4.3](#)]
- On the Home page, covers and titles receive focus separately (e.g., "Antimicrobial Agents and Chemotherapy"). [[WCAG 2.0 SC 2.4.3](#)]
- On the Article page, focus does not immediately enter lightboxes (e.g., Citation Tools, Email, Share) when they are opened. [[WCAG 2.0 SC 2.4.3](#)]
- Focus is not sufficiently visible for most interactive content. [[WCAG 2.0 SC 2.4.7](#)]
  - Plain text links throughout site
  - "Skip to main content" link, header links ("Register", "Subscribe", etc.) and footer links
  - Ad images
  - Rotator items on Home page
  - Covers and titles on Home page
  - "American Society for Microbiology" and "ASM Journals" links at top of Home, Search Results, and Advanced Search pages
  - "American Society for Microbiology" and "Clinical and Vaccine Immunology" links at top of Issue and Article pages
  - Icons (Edit Search, Alert, and Save) and Search result titles on Search Results page
  - Checkboxes, radio buttons, "Search" button, and collapsible headings on Advanced Search page and Edit Search variant of Search Results page
  - Table of Contents elements and cover image on Issue page
  - Citation links, figure image links, "Related Articles", and "TREND MD" on Article page
  - Buttons under "Article Usage" in Info & Metrics tab on Article page
  - Citation Manger Formats buttons in Citation Tools lightbox on Article page
  - "Send Message" in Email lightbox on Article page
  - "Copy" button in Share lightbox on Article page
  - Close buttons in lightboxes on Article page
- "ASM Journals" menu expands on keyboard focus. [[WCAG 2.0 SC 3.2.1](#)]

## Navigation

- Article and Issue pages do not have appropriately descriptive titles (the site name ["ASM Journals"] is not included). [[WCAG 2.0 SC 2.4.2](#)]
- PDF lacks descriptive title (while a programmatic title exists in the PDF, the document is not set to display/use it). [[WCAG 2.0 SC 2.4.2](#)]
- On the Article page, there is no way for users to determine the target of "-" links (e.g., "-" in "9-14" links to Reference 10). [[WCAG 2.0 SC 2.4.4](#)]
- On the Article page, it is not clear to users that figure links open images in lightboxes. [[WCAG 2.0 SC 2.4.4](#)]

## Forms and Data Submission

- On the Issue page, "Search for this keyword" not an appropriate programmatic label for "Search this issue" input. [[WCAG 2.0 SC 3.3.2](#)]
- On the Advanced Search page and the Edit Search section of the Search Results page, "Date of Publication", "Include articles in Journal", "Include Only", "words", "Sort", "Format Results" labels are not programmatically associated with inputs. [[WCAG 2.0 SC 3.3.2](#)]
- On the Advanced Search page and the Edit Search section of the Search Results page, instructions are not programmatically associated with inputs (e.g., "Type a term to search within all articles in this journal: e.g., stem cell" for "Search Terms & Keywords" input). [[WCAG 2.0 SC 3.3.2](#)]

## Images

- Appropriate alternative text is not provided for images. [[WCAG 2.0 SC 1.1.1](#)]
  - "publisher-logo" is not appropriate alternative text for "American Society for Microbiology"
  - "ASM Journals" is not appropriate alternative text for "Journals.ASM.org" in footer
  - Ads lack alternative text
  - On the Home, Search Results, and Advanced Search pages, "site-logo" is not appropriate alternative text for "ASM Journals"
  - On the Issue and Article pages, "site-logo" is not appropriate alternative text for "Clinical and Vaccine Immunology"
  - On the Home page, rotator alternative text does not provide all text in images
  - On the Home and Issue pages, journal covers are decorative, and should have null alternative text
  - On the Issue page, "Free" is not appropriate alternative text for check mark graphics (there is no indication that checkmarks equate to "free" on the page)
  - On the Article page, article figures lack alternative text
  - On the Article page, "TREND MD" and gear icon lack alternative text
  - All images in PDF lack alternative text
- Image of text are used in place of styled text. [[WCAG 2.0 SC 1.4.5](#)]
  - "Journals.ASM.org" in footer
  - Rotator images on Home page
  - "ASM Journals" on Home, Search Results, and Advanced Search pages
  - "Clinical and Vaccine Immunology" on Issue and Article pages
  - Images in PDF

## Color and Visual Characteristics

- Grey magnifying glass icons on white backgrounds (search inputs), red icons on dark blue (rotator navigation dots on Home page), white zoom icons on grey (article figures on Article page), light grey text on white (e.g., "Clin Vaccine Immunol" under "We recommend", and "TREND MD" and gear icon on Article page), and grey icons on light grey ("x" to clear selected items in "Include articles in Journal" input on Advanced Search page) have insufficient contrast. [[WCAG 2.0 SC 1.4.3](#)]

- In the PDF, white "iD" on green background next to "Wilbur H. Chen", red text on white (e.g., "Abstract"), and yellow content on white (e.g., graph content in Figure 2) have insufficient contrast. [[WCAG 2.0 SC 1.4.3](#)]

## **Custom Elements and Dynamic Content**

- On the Home page, no obvious means is provided to pause, stop, or hide rotator. [[WCAG 2.0 SC 2.2.2](#), [WCAG 2.0 CR 5](#)]
- On the Advanced Search page and the Edit Search section of the Search Results page, roles and values (i.e., that they expand and whether they are expanded or collapsed) are not provided for expanders (e.g., "LIMIT RESULTS"), and screen readers are not notified when they are opened or closed. [[WCAG 2.0 SC 4.1.2](#)]
- On the Article page, correct roles and values (i.e., that they are tabs and whether or not they are selected) are not provided for "Article", "Figures & Data", and "Info & Metrics" tabs. [[WCAG 2.0 SC 4.1.2](#)]
- On the Advanced Search page and the Edit Search section of the Search Results page, names of journals in the "Include articles in Journal" dropdown and the current dropdown value (i.e., selected journals) are not read out by screen readers. [[WCAG 2.0 SC 4.1.2](#)]
- Names of expanding menu items ("Subscriptions" and "About" on Home, Search Results, and Advanced Search pages; "Articles" and "About the Journal" on Issue and Article pages) are not provided (screen readers only identify those items as "Menu"). [[WCAG 2.0 SC 4.1.2](#)]

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