

# Identification of regulatory networks associated with anti-HIV/AIDS genes via integrated transcriptome, epigenome and proteome analyses

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The Manuscript Microscope Sentence Audit is a research paper introspection system that parses the text of your manuscript into minimal sentence components for faster, more accurate, enhanced proofreading.

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- **Accelerated Proofreading:** Examine long technical texts in a fraction of the usual time.
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**Manuscript Source:** <https://www.biorxiv.org/content/10.1101/2021.03.21.436300v1>

**Manuscript Authors:** Gexin Liu, Chunlin Zhang, Lei Shi & Zhenglin Zhu

### Features of the Sentence Audit:

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The Minimal Sentence Components shown are the smallest coherent elements of each sentence of your text as derived from it's conjunctions, prepositions and selected punctuation symbols (i.e. commas, semicolons, round and square brackets).

The combined approaches ensure easier, faster, more effective proofreading.

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- The sentence parsing is achieved using a prototype natural language processing pipeline written in Python and may include occasional errors in sentence segmentation.
- Depending on the source of the input text, the Sentence Audit may contain occasional html artefacts that are parsed as sentences (E.g. "Download figure. Open in new tab").
- Always consult the original research paper as the true reference source for the text.

### Contact Information:

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### Research Paper Sections:

The sections of the research paper input text parsed in this audit.

[illegible]

Title

# Identification of regulatory networks associated with anti-HIV/AIDS genes via integrated transcriptome, epigenome and proteome analyses

### S1 [001] Abstract

**S1 [002]** There are individuals naturally resistant to HIV.

There are individuals naturally resistant ...  
... to HIV.

**S1 [003]** To identify anti-HIV genes and regulatory networks that enable the native ability to resist HIV, we reanalyzed the transcriptome of HIV resistant and susceptible individuals based on previous efforts, and performed regulatory network prediction using HIV-infection related DNA methylation, miRNA and Chip-SEQ data.

To identify anti-HIV genes ...  
... and regulatory networks ...  
... that enable the native ability ...  
... to resist HIV, ...  
... we reanalyzed the transcriptome ...  
... of HIV resistant ...  
... and susceptible individuals based ...  
... on previous efforts, ...  
... and performed regulatory network prediction ...  
... using HIV-infection related DNA methylation, ...  
... miRNA ...  
... and Chip-SEQ data.

**S1 [004]** We totally found 25 potential anti-HIV genes and 23 of them are newly identified.

We totally found 25 potential anti-HIV genes ...  
... and 23 of them are newly identified.

**S1 [005]** They are enriched in pathways of immunity, neurological system and cell signaling.

They are enriched ...  
... in pathways ...  
... of immunity, ...  
... neurological system ...  
... and cell signaling.

**S1 [006]** 4 anti-HIV genes show DNA hypermethylation signatures and 4 are possibly bounded by the HIV-1 Trans-Activator of Transcription protein (Tat).

4 anti-HIV genes show DNA hypermethylation signatures ...  
... and 4 are possibly bounded ...  
... by the HIV-1 Trans-Activator ...  
... of Transcription protein ...

... (Tat).

**S1 [007]** We found a potential HIV-resistance correlated miRNA hsa-miR-3074-5p possibly regulating an anti-HIV hub gene JUN.

We found a potential HIV-resistance correlated miRNA hsa-miR-3074-5p possibly regulating an anti-HIV hub gene JUN.

**S1 [008]** Our findings provide novel insights for AIDS treatments and approaches to HIV vaccine design.

Our findings provide novel insights ...

... for AIDS treatments ...

... and approaches ...

... to HIV vaccine design.

## **S2 [009] Introduction**

**S2 [010]** The acquired immunodeficiency syndrome, AIDS [1], as an epidemic and pandemic disease, has caused 33 million reported deaths in recent 40 years, after the first identification of HIV, the human immunodeficiency virus [2], Global statistics show that there are 38 million HIV infections, 1.7 million new infections and 690 thousands AIDS-related confirmed deaths in 2019 [3].

The acquired immunodeficiency syndrome, ...

... AIDS ...

... [1], ...

... as an epidemic ...

... and pandemic disease, ...

... has caused 33 million reported deaths ...

... in recent 40 years, ...

... after the first identification ...

... of HIV, ...

... the human immunodeficiency virus ...

... [2], ...

... Global statistics show ...

... that there are 38 million HIV infections, ...

... 1.7 million new infections ...

... and 690 thousands AIDS-related confirmed deaths ...

... in 2019 ...

... [3].

**S2 [011]** HIV/AIDS remains a serious threat to human health.

HIV/AIDS remains a serious threat ...

... to human health.

**S2 [012]** As a retrovirus and a lentivirus, HIV has two subtypes, HIV-1 and HIV-2.

As a retrovirus ...

... and a lentivirus, ...

... HIV has two subtypes, ...  
... HIV-1 ...  
... and HIV-2.

**S2 [013]** Compare to HIV-2, HIV-1 is more infectious and aggressive.

Compare ...  
... to HIV-2, ...  
... HIV-1 is more infectious ...  
... and aggressive.

**S2 [014]** HIV targets and destroys human CD4+ T cells [4–6], disrupting the human immune system and rendering it susceptible to exogenous infectious diseases, such as tuberculosis, [7] and tumors [8].

HIV targets ...  
... and destroys human CD4+ T cells ...  
... [4–6], ...  
... disrupting the human immune system ...  
... and rendering it susceptible ...  
... to exogenous infectious diseases, ...  
... such as tuberculosis, ...  
... [7] ...  
... and tumors ...  
... [8].

**S2 [015]** Until now, there is still no effective medicine to radically cure AIDS nor vaccine to prevent HIV infection [9].

Until now, ...  
... there is still no effective medicine ...  
... to radically cure AIDS ...  
... nor vaccine ...  
... to prevent HIV infection ...  
... [9].

**S2 [016]** A major treatment against AIDS is the highly active antiretroviral therapy (HAART), which jointly uses three or more antivirus medicines to prevent the replication of HIV virus [10].

A major treatment ...  
... against AIDS is the highly active antiretroviral therapy ...  
... (HAART), ...  
... which jointly uses three ...  
... or more antivirus medicines ...  
... to prevent the replication ...  
... of HIV virus ...  
... [10].

**S2 [017]** This therapy can reduce the virus load (VL) in plasma to a small level, usually undetectable by normal HIV detection methods.

This therapy can reduce the virus load ...  
... (VL) ...  
... in plasma ...

... to a small level, ...  
... usually undetectable ...  
... by normal HIV detection methods.

**S2 [018]** However, the virus load will bounce from hidden infected cells if the therapy is terminated [11].

However, ...  
... the virus load will bounce ...  
... from hidden infected cells ...  
... if the therapy is terminated ...  
... [11].

**S2 [019]** HAART cannot radically cure AIDS.

HAART cannot radically cure AIDS.

**S2 [020]** Currently developed HIV vaccines, such as RV144 [12], are capable of preventing the infection of HIV to some extent but are far from effective.

Currently developed HIV vaccines, ...  
... such as RV144 ...  
... [12], ...  
... are capable ...  
... of preventing the infection ...  
... of HIV ...  
... to some extent ...  
... but are far ...  
... from effective.

**S2 [021]** The obstacles are the fast mutation of HIV populations [13] and the lack of the understanding of the complex interaction between HIV and human immune system.

The obstacles are the fast mutation ...  
... of HIV populations ...  
... [13] ...  
... and the lack ...  
... of the understanding ...  
... of the complex interaction ...  
... between HIV ...  
... and human immune system.

**S2 [022]** With the spread of HIV around the world, it is observed that some individuals are naturally resistant to HIV.

With the spread ...  
... of HIV ...  
... around the world, ...  
... it is observed ...  
... that some individuals are naturally resistant ...  
... to HIV.

## **End of Sample Audit**

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