AptBacterialDB REST API

User Guide

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1. Introduction

AptBacterialDB is a curated database of experimentally validated antibacterial aptamers, with 2,131 entries at the time of writing. The REST API gives programmatic, read-only access to these entries. With ordinary web requests you can filter records by organism, target, year, length and other attributes, and receive the results as JSON for use in scripts and analysis pipelines.

This guide is written for researchers and developers who have not used the API before. No programming is needed to try it: any web browser can send a request.

2. Getting started

Item	Value
Base URL	https://webs.iiitd.edu.in/raghava/aptbacterialdb/api/query.php
Request method	GET
Response format	JSON, UTF-8
Authentication	None. No API key or login is required
Access	Read-only. The API cannot modify the database
Use from web pages	Cross-origin (browser) requests are allowed

Your first request

Paste the address below into a browser. It returns the first two records. A request with no parameters returns the first 10 records.

https://webs.iiitd.edu.in/raghava/aptbacterialdb/api/query.php?limit=2

3. Building a query

3.1 Filter syntax

A filter has the form column:operator=value and is added to the base URL after a question mark. The rules are:

- Join several filters with &. A record is returned only if it matches all of them (logical AND).
- Percent-encode spaces and slashes in column names: %20 for a space and %2F for /, for example Target%20Organism and PMID%2FDOI.
- Values are limited to 300 characters; longer values are cut.
- A filter without an operator (Length=50) or with an empty value (Length:gt=) is ignored without an error, so the request returns unfiltered results.
- If the same column:operator pair is repeated, only the last value is used. To set a range, combine two operators, for example Year:gte and Year:lte.

3.2 Filterable columns

Column names are case-sensitive. Columns marked * also accept the numeric operators.

Column	Column
AptBacDB_ID	Target Organism
PMID/DOI	Target
Year*	Determination of affinity method
Title	Activity Role
Aptamer name	Method
Length*	Modification
Library	Potential Candidate
Type	Patent

The remaining fields listed in Section 4.2 appear in results but cannot be used as filters.

3.3 Operators

Operator	Meaning	Applies to	Example
eq	Equals (exact match)	All filterable columns	AptBacDB_ID:eq=ABdb_0015
ne	Not equal	All filterable columns	Type:ne=ssDNA
contains	Partial match anywhere in the value	All filterable columns	Target:contains=bacteria
gt	Greater than	Year, Length only	Length:gt=99
lt	Less than	Year, Length only	Length:lt=100
gte	Greater than or equal to	Year, Length only	Year:gte=2017
lte	Less than or equal to	Year, Length only	Year:lte=2010

Numeric operators compare numbers, not text, and skip records whose value is not a number (for example N/A). Using one on another column, or with a non-numeric value, returns an error (Section 6).

3.4 Query examples

Add each query string to the base URL from Section 2.

Purpose	Query string
1. Default request (first 10 records)	(none)
2. Text filter	?Target:contains=bacteria
3. Exact match on ID	?AptBacDB_ID:eq=ABdb_0015
4. All aptamers from one publication	?PMID%2FDOI:eq=12799428
5. Numeric filter	?Length:gt=99&limit=100
6. Multiple filters	?Target:contains=bacteria&Year:gte=2017
7. Organism and year	?Year:lt=2013&Target%20Organism:contains=Salmonella
8. Pagination (records 11 to 15)	?limit=5&offset=10

4. Understanding the results

4.1 Response structure

Every successful response is a JSON object with three keys:

Key	Type	Description
status	string	success for a valid request
count	integer	Number of records in this response, not the total number of matches
data	list	The matching records, each with the fields in Section 4.2

A query with no matches is not an error: it returns `count` 0 and an empty `data` list. Use a field's exact name to read it, for example `Target Organism`. The field `Kd  value` has two spaces in its name.

4.2 Field descriptions

All fields are returned as text strings, including `Year` and `Length`; convert them yourself if you need numbers. The text `N/A` means no value is recorded. Special characters such as 5′, µ and ± are returned as plain UTF-8.

Field	Description	Example
AptBacDB_ID	Unique identifier of the database entry	ABdb_0015
PMID/DOI	PubMed ID or DOI of the source publication	16189080
Year	Publication year	2005
Title	Title of the source publication	Aptamers that preferentially bind type IVB pili...
Aptamer name	Name of the aptamer as given in the publication	S-PS8.4
Sequence (5′ to 3′)	Aptamer nucleotide sequence, written 5′ to 3′; hyphens may separate segments	GCGGAAUUCUAAUACGACUC...
Length	Aptamer length in nucleotides	88
Library	SELEX library used; the random region is shown as N with its length	5'-GCGGAATT...-N30-GGGTCAATGCGTCATA-3'
Type	Nucleic acid type	ssRNA, ssDNA
Target Organism	Bacterial species or strain the aptamer relates to	Salmonella Typhi
Target	Molecular or cellular target of the aptamer	Type IVB Pili structural proteins
Objective/Mechanism	Aim of the study and the reported mechanism	Identify an aptamer that binds to type IVB pili...
Outcome/Inhibitory effect	Reported experimental outcome or inhibitory effect	2.0 µg of RNA aptamer S-PS8.4 effected ca. 71% inhibition...
No. of selection round SELEX	Number of SELEX selection rounds	8
Determination of affinity method	Method used to measure binding affinity	Nitrocellulose Filter Binding Assay

Field	Description	Example
Kd value	Reported dissociation constant as free text with its unit; may hold several values or notes, so it is not always a single number	8.56 nM
Activity Role	Functional role of the aptamer	Therapeutics, Detection
Method	Selection method	SELEX, Mirror-Image SELEX
Modification	Chemical modification or label of the aptamer	5'-Radiolabelled (32P-labeled)
Cytotoxicity (cell viability)	Reported cytotoxicity or cell viability result	N/A
Stability	Reported stability result	N/A
Potential Candidate	Best Candidate where curators flagged the entry; otherwise N/A	Best Candidate
Half-life	Reported half-life	N/A
Patent	Patent information	N/A

5. Retrieving large result sets

Use the pagination parameters to move through long result lists.

Parameter	Description	Default	Limits
limit	Number of records to return	10	Minimum 1, maximum 100. Larger values are reduced to 100; 0 or non-numeric values return 1 record
offset	Number of records to skip	0	Negative values are treated as 0

- Because `count` reports only the current response, read a complete result by requesting `limit=100` and raising `offset` by 100 until a response returns fewer than 100 records. The full database takes about 22 requests.
- No explicit sort order is applied; records have consistently been returned in ascending `AptBacDB_ID` order.
- Pause briefly between requests. Rapid bursts may be temporarily blocked (HTTP 403). The Downloads page of the web server lists downloadable data files.

6. Troubleshooting

6.1 Error responses

Errors are returned as JSON with `status` set to `error` and a `message`.

HTTP	Message	Cause
400	Invalid column: <name>	The column is not filterable (Section 3.2) or is spelled differently
400	Invalid operator: <name>	The operator is not one of eq, ne, contains, gt, lt, gte, lte

HTTP	Message	Cause
400	Numeric operator cannot be used with <column>	gt, lt, gte or lte used on a column other than Year or Length
400	Numeric value required for <column>	A non-numeric value was given with a numeric operator
403	Forbidden	A burst of rapid requests was blocked by the web server. Pause and retry
500	status, stage, message	A server-side fault, not a problem with your query. Retry later

6.2 Common problems

Problem	Solution
Results are not filtered	Write every filter as column:operator=value with a non-empty value (Section 3.1).
A command-line tool rejects the URL	Encode spaces as %20 and slashes as %2F. In scripts, pass column names as ordinary parameter names and let your HTTP library encode them.
Only 100 records come back	This is the maximum per response. Page with offset (Section 5).
Converting Year or Length to a number fails	The values are text and may be N/A. Check for N/A before converting.
Kd value cannot be read as a number	It is free text with units and sometimes several values. Treat it as text.