

# ABDA API usage

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## Version History

| Date       | Version | Changes   |
|------------|---------|---|
| 10-20-2023 | 0.1.0   | Initial document                                      |
| 11-06-2023 | 0.2.0   | Updates authorization schema (Bearer format)          |
| 02-21-2024 | 0.3.0   | Adds PZN search endpoint, fixed documentation error   |
| 02-22-2024 | 0.4.0   | Adds /pzns/products endpoint                          |
| 03-19-2024 | 0.5.0   | Changes /pzns/products endpoint to include ATC output |

## General Remarks

The ABDATA API has been provided by the Saarland University Clinical Pharmacy working group. The API is not intended for public use, but only for usage within the SafePolyMed project. This document is intended as a guide for using the API, it is, however, not a comprehensive manual or technical documentation of the API.

## Access

The API is provided under the following URL: <https://abdata.clinicalpharmacy.me/api>.

## Usage and Testing Info

The API is generally intended for usage with dedicated console utilities such as *curl* or the corresponding utilities in programming languages such as the *httr* or similar packages in the *R* programming language. There is no dedicated endpoint for testing access to the API yet. However, testing **GET** endpoints is possible in a browser, for instance <https://abdata.clinicalpharmacy.me/api/limits> should return

```
{
  "type": "https://tools.ietf.org/html/rfc7235#section-3.1",
  "title": "Unauthorized",
  "status": 401,
  "detail": "No login token provided.",
  "instance": "/limits"
}
```

## Authorization

This API uses *Java Web Token (jwt)* for authentication. A *jwt* is provided to you [upon login](#) and must be provided when accessing all other routes. See [GET /interactions/compounds](#) as an example on how to provide the token.

## Endpoints

The following is a list of endpoints for the API. All endpoints are only accessible **without a trailing slash!** All routes refer to <https://abdata.clinicalpharmacy.me/api> as the root URI. Currently, all access to all routes other than [POST /login](#) **require authentication**.

| Group        | Method | Route                     | Description   |
|--------------|--------|---------------------------|---|
| user         | POST   | /login                    | Log a user in. See <a href="#">POST /login</a> for more information and example usage.  |
| user         | GET    | /renew-token              | Retrieve a new token. No parameters.  |
| information  | GET    | /formulations             | Retrieve a list of all formulations within the database. No parameters.   |
| information  | GET    | /limits                   | Request limits of the server. No parameters.  |
| information  | GET    | /interactions/description | Request description of the interaction table. No parameters.  |
| interactions | GET    | /interactions/compounds   | Interaction endpoint for compound names input. See <a href="#">GET /interactions/compounds</a> for more information and example usage.            |
| interactions | POST   | /interactions/compounds   | Interaction endpoint for compound names input from JSON. See <a href="#">POST /interactions/compounds</a> for more information and example usage. |
| interactions | GET    | /interactions/pzns        | Interaction endpoint for pzn input. See <a href="#">GET /interactions/pzns</a> for more information and example usage.                            |
| interactions | POST   | /interactions/pzns        | Interaction endpoint for pzn input from JSON. See <a href="#">POST /interactions/pzns</a> for more information and example usage.                 |
| atc          | GET    | /atcs/drugs               | Drug endpoint for ATC input   |
| pzns         | GET    | /pzns/products            | Drug products endpoint for PZN input  |

## Example Usage

### POST /login

#### Input

Provide your credentials as a *JSON*. The *JSON* must be structured as follows:

```
{
  "credentials": {
    "username": "your_username",
    "password": "your_password"
  }
}
```

```
}  
}
```

## Example Usage

```
curl -X POST "https://abdata.clinicalpharmacy.me/api/login" \
-H "accept: application/json" \
-H "Content-Type: application/json" \
-d '{"credentials":{"username":"username","password":"password"}}'
```

## Output

The return value for a successful **POST** request has the following structure:

```
{  
  "yourjwttoken"  
}
```

## GET /interactions/compounds

### Input

Check for interactions based on compound names provided as query parameters.

## Example Usage

```
# wrong  
curl -X GET "https://abdata.clinicalpharmacy.me/api/interactions/compounds?  
compounds=verapamil,simvastatin" \
-H "accept: application/json" \
-H "Content-Type: application/json" \
-H "Authorization: Bearer yourjwttoken"
```

## Output

The return value for a successful **GET** request has the following structure:

```
{  
  "interactions": [  
    {  
      "plausibility": "plausible mechanism",  
      "relevance": "severe",  
      "frequency": "not known",  
    }  
  ]  
}
```

```
    "credibility": "high",
    "direction": "unidirectional interaction",
    "left_compound": "Simvastatin",
    "right_compound": "Verapamil",
    "left_atc": "C10AA01",
    "right_atc": "C08DA01",
    "left_formulation": "FTA",
    "right_formulation": "FTA",
    "left_medication": "ZOCOR 10mg",
    "right_medication": "Isoptin 80mg",
    "left_dose": "10 mg",
    "right_dose": "74.06 mg"
  }
],
"unknown_compounds": [],
"timestamp": "2023-10-20 13:20:57",
"api_version": "0.3.0",
"compounds": [
  "verapamil",
  "simvastatin"
]
}
```

## POST /interactions/compounds

### Input

Check for interactions based on compound names provided as *JSON*. Drug lists must be provided matched to an *ID*:

```
{
  [
    {
      "id": "1",
      "compounds": ["verapamil", "simvastatin"]
    },
    {
      "id": "2",
      "compounds": ["diltiazem", "amiodarone", "amlodipine", "lovastatin"]
    }
  ]
}
```

### Example Usage

```
curl -X POST "https://abdata.clinicalpharmacy.me/api/interactions/compounds" \
-H "Authorization: Bearer yourjwttoken" \
-H "Content-Type: application/json" \
```

```
-d '[{"id":"1","compounds":["verapamil","simvastatin"]},
{"id":"2","compounds":["diltiazem","amiodarone","amlodipine","lovastatin"]}']
```

## Output

The return value for a successful **POST** request has the following structure:

```
{
  "results": [
    {
      "interactions": [
        {
          "plausibility": "plausible mechanism",
          "relevance": "severe",
          "frequency": "not known",
          "credibility": "high",
          "direction": "unidirectional interaction",
          "left_compound": "Simvastatin",
          "right_compound": "Verapamil",
          "left_atc": "C10AA01",
          "right_atc": "C08DA01",
          "left_formulation": "FTA",
          "right_formulation": "FTA",
          "left_medication": "ZOCOR 10mg",
          "right_medication": "Isoptin 80mg",
          "left_dose": "10 mg",
          "right_dose": "74.06 mg"
        }
      ],
      "unknown_compounds": [],
      "id": "1",
      "compounds": [
        "verapamil",
        "simvastatin"
      ]
    },
    {
      "interactions": [
        {
          "plausibility": "plausible mechanism",
          "relevance": "moderate",
          "frequency": "not known",
          "credibility": "weak",
          "direction": "undirected interaction",
          "left_compound": "Amiodarone",
          "right_compound": "Diltiazem",
          "left_atc": "C01BD01",
          "right_atc": "C08DB01",
          "left_formulation": "DFL",
          "right_formulation": "RET",
          "left_medication": "Cordarex 150mg/3ml Injektionslösung",
```

```
    "right_medication": "Dilzem 120mg retard",
    "left_dose": "141.98 mg",
    "right_dose": "110.3 mg"
  },
  {
    "plausibility": "plausible mechanism",
    "relevance": "severe",
    "frequency": "not known",
    "credibility": "high",
    "direction": "unidirectional interaction",
    "left_compound": "Lovastatin",
    "right_compound": "Amiodarone",
    "left_atc": "C10AA02",
    "right_atc": "C01BD01",
    "left_formulation": "TAB",
    "right_formulation": "DFL",
    "left_medication": "Lovastatin AL 20mg",
    "right_medication": "Cordarex 150mg/3ml Injektionslösung",
    "left_dose": "20 mg",
    "right_dose": "141.98 mg"
  },
  {
    "plausibility": "plausible mechanism",
    "relevance": "severe",
    "frequency": "not known",
    "credibility": "high",
    "direction": "unidirectional interaction",
    "left_compound": "Lovastatin",
    "right_compound": "Diltiazem",
    "left_atc": "C10AA02",
    "right_atc": "C08DB01",
    "left_formulation": "TAB",
    "right_formulation": "RET",
    "left_medication": "Lovastatin AL 20mg",
    "right_medication": "Dilzem 120mg retard",
    "left_dose": "20 mg",
    "right_dose": "110.3 mg"
  },
  {
    "relevance": "no statement possible",
    "left_compound": "Lovastatin",
    "right_compound": "Amlodipine",
    "right_atc": "C08CA01",
    "right_formulation": "TAB",
    "right_medication": "Norvasc 5mg",
    "right_dose": "5 mg"
  }
],
"unknown_compounds": [],
"id": "2",
"compounds": [
  "diltiazem",
  "amiodarone",
  "amlodipine",
```

```
    "lovastatin"
  ]
}
],
"timestamp": "2023-10-20 13:21:59",
"api_version": "0.3.0"
}
```

## POST /interactions/pzns

### Input

Check for interactions based on PZNs (*Pharmazentralnummer*, a German product identifier for drugs) provided as *JSON*. Lists of PZNs must be provided matched to an *ID*:

```
[
  {
    "id": "1",
    "pzns": ["03041347", "17145955", "00592733", "13981502"]
  },
  {
    "id": "2",
    "pzns": ["03041347", "17145955", "00592733", "13981502"]
  }
]
```

### Example Usage

```
curl -X POST "https://abdata.clinicalpharmacy.me/api/interactions/pzns" \
-H "Authorization: Bearer yourjwttoken" \
-H "Content-Type: application/json" \
-d '[{"id": "1", "pzns": ["03041347", "17145955", "00592733", "13981502"]}, {"id": "2", "pzns": ["03041347", "17145955", "00592733", "13981502"]}']
```

### Output

The return value for a successful **POST** request has the following structure:

```
{
  "results": [
    {
      "interactions": [
        {
          "plausibility": "plausible mechanism",
          "relevance": "minor",

```

```
        "frequency": "not known",
        "credibility": "weak",
        "direction": "unidirectional interaction",
        "left_PZN": "03041347",
        "right_PZN": "00592733"
      }
    ],
    "unknown_pzns": [],
    "id": "1",
    "pzns": [
      "03041347",
      "17145955",
      "00592733",
      "13981502"
    ]
  },
  {
    "interactions": [
      {
        "plausibility": "plausible mechanism",
        "relevance": "minor",
        "frequency": "not known",
        "credibility": "weak",
        "direction": "unidirectional interaction",
        "left_PZN": "03041347",
        "right_PZN": "00592733"
      }
    ],
    "unknown_pzns": [],
    "id": "2",
    "pzns": [
      "03041347",
      "17145955",
      "00592733",
      "13981502"
    ]
  }
],
"timestamp": "2023-10-20 13:17:41",
"api_version": "0.3.0"
}
```

## GET /atcs/drugs

### Input

Get drug names based on ATCs. Please note, that some ATCs may not resolve to a unique drug product, especially in case of fixed drug combinations

### Example Usage



```
curl -X GET "https://abdata.clinicalpharmacy.me/api/atcs/drugs?
atcs=C01BD01,C08DB01,C08DA01,J01CR02" \
-H "accept: */*" \
-H "Authorization: Bearer yourjwttoken"
```

## Output

The return value for a successful **GET** request has the following structure:

```
{
  "names": [
    {
      "atc": "C01BD01",
      "name_german": "Amiodaron",
      "name_english": "Amiodarone"
    },
    {
      "atc": "C08DA01",
      "name_german": "Verapamil",
      "name_english": "Verapamil"
    },
    {
      "atc": "C08DB01",
      "name_german": "Diltiazem",
      "name_english": "Diltiazem"
    },
    {
      "atc": "J01CR02",
      "name_german": "Amoxicillin und Beta-Lactamase-Inhibitor",
      "name_english": "Amoxicillin and beta-lactamase inhibitor"
    }
  ],
  "unknown_atcs": [],
  "timestamp": "2023-10-20 10:56:21",
  "api_version": "0.3.0",
  "atcs": ["C01BD01", "C08DB01", "C08DA01", "J01CR02"]
}
```

GET /pzns/products

## Input

Get product names and ATC codes based on PZNs. Please note, that some PZNs may not be up to date.

## Example Usage

```
curl -X GET "https://abdata.clinicalpharmacy.me/api/pzns/products?
pzns=03967062,03041347,00592733" \
-H "accept: */*" \
-H "Authorization: Bearer yourjwttoken"
```

## Output

The return value for a successful **GET** request has the following structure:

```
{
  "products": [
    {
      "pzn": "00592733",
      "product": "Famotidin STADA 40mg",
      "atc": "A02BA03"
    },
    {
      "pzn": "03041347",
      "product": "Domperidon AbZ 10mg",
      "atc": "A03FA03"
    },
    {
      "pzn": "03967062",
      "product": "MCP-ratiopharm 10mg",
      "atc": "A03FA01"
    }
  ],
  "unknown_pzns": [],
  "timestamp": "2024-02-22 09:05:55",
  "api_version": "0.3.0",
  "pzns": [
    "03967062",
    "03041347",
    "00592733"
  ]
}
```